VOL. 179 No. 6 AMERICAN NOVEMBER, 1953

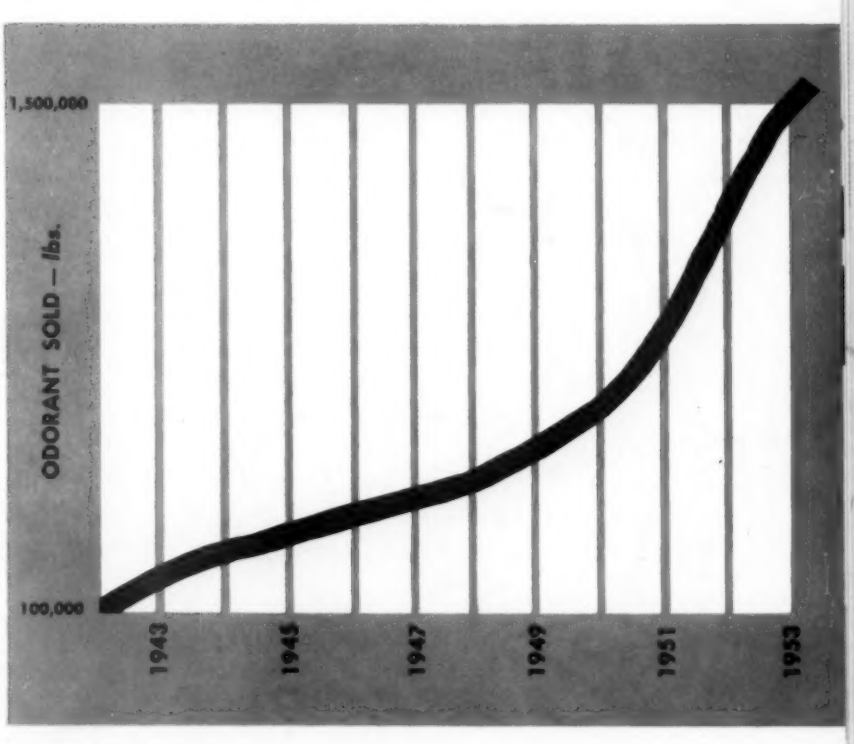
Gas Journal

JAN 20 1954

We are proud of this curve...

This sales record, together with our list of satisfied customers and our fine employees, is the best proof we know of that good service, good products, and hard work pay off.

CHARLES E. GILL, President



1942 CONCENTRATED ODORANTS . . . with true, gaslike smell, available for the first time.

1943 PIPELINE ODORIZATION . . . 400-mile penetration.

1944 CANNED ODORANT . . . for L P G odorization.

1945 MODERN PLANT . . . constructed in Houston, Texas.

1946 INCORPORATION . . . company devoted entirely to gas odorization.

1947 EXPERIENCED GAS ENGINEERS . . . to handle sales and service (expanded sales force).

1948 SIX ODORANTS . . . available to gas industries.

1949 PLANT ENLARGEMENT . . . new office building.

1950 TERRITORY WAREHOUSING . . Philadelphia warehouse installed.

1951 TANK TRUCK DELIVERY . . . U.S.A. (added sales engineers).

1952 AFFILIATION — AMERICAN RESEARCH & DEVELOPMENT CORP., Boston, Mass.

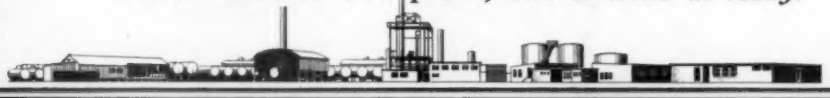
1953 ADDITIONAL PLANT ENLARGEMENT.

captan

Prompt Service from our . . .

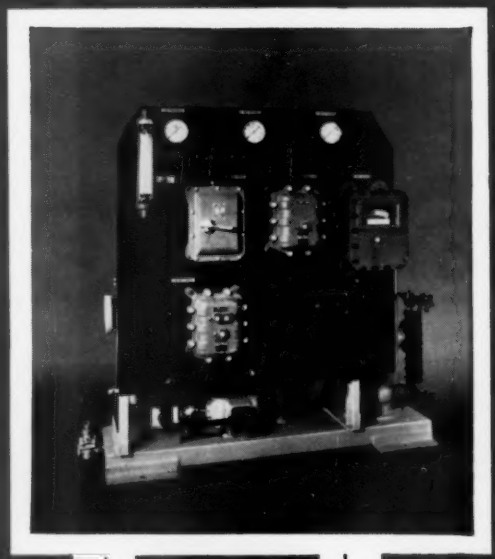
* EXPERT SPECIALLY TRAINED ENGINEERS
* COMPETENT OFFICE FORCE
* STRATEGICALLY LOCATED WAREHOUSES
* RELIABLE SHIPPING SERVICE

DON'T DELAY . . . phone, wire or write us today.



NATURAL GAS ODORIZING CO., INC.

P. O. BOX 1645 HOUSTON, TEXAS



RAW GAS TO CLEANER

CLEAN GAS TO FOGGER

CLEANED, FOGGED GAS

Here's the team that knocks maintenance costs for a loop!

BLAW-KNOX GAS CLEANERS PLUS BLAW-KNOX OIL FOGGERS

1. Remove even the smallest dust particles.
2. Insure your customers of a continuous supply of clean gas.
3. Protect company against costly service complaints due to dust in the line.
4. Minimize eroding of regulators, valves, compressor parts and meters.
5. Insure lower transportation and distribution costs.

1. Produce a stable oil fog throughout the lines.
2. Wet down existing dust and scale deposits.
3. Moisten leather diaphragms, and jute-joint packing.
4. Coat inside of pipe with protective oil film.
5. Prevent loss of odorant from reaction with pipe scale.

We can give you the facts and figures to prove that *you cannot afford dirty gas.* Twenty-five years service to the Gas Industry, plus continuing research, show conclusively that operating and maintenance expenses due to pipe line dust cost more than the installation of Blaw-Knox Gas Cleaners and Oil Foggers . . . For interesting and convincing data on this important subject, write for our latest BULLETIN—NO. 2353.

BLAW-KNOX

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
GAS EQUIPMENT DEPARTMENT
Pittsburgh 22
Pennsylvania

JAN -7 1954

STURDY SENTINELS OF SECURITY

On guard over the skyline of Houston, Texas, stands this sturdy Rockwell High Pressure Balanced Valve regulator. Quick operating, positive acting Nordstrom valves complete a picture of gas line security that gives the rightful impression of better service and protection from the use of the finest, safest equipment.

THE SERVICE EASE AND ECONOMY OF REPLACEABLE VALVE CHAMBERS

Rockwell regulators rarely, if ever, need be lifted for service. That's because all parts subject to wear or abrasion can be economically replaced *with the regulator in the line*. The valve chamber can be easily removed through a hand hole area in the body. A new or rebuilt assembly having either hard or soft seats readily bolts in its place. And the capacity of the regulator can be changed at will by substituting a different size valve chamber on the same bolt circle.

SERVE WELL WITH SAFETY

Above is pictured a pilot loaded Rockwell high pressure regulator with auxiliary spring control. This control operates as a conventional pilot loading system unless the loading pressure falls below the amount required for proper operation. If that occurs, the auxiliary spring control automatically takes over at a slightly lower outlet pressure.

ROCKWELL *Balanced Valve* REGULATORS

HERE'S A TRIPLE SURE ROCKWELL SETTING

Installation of Rockwell No. 4 meters fitted with Combined Record gauges. Pressure is governed by spring loaded Rockwell High Pressure Balanced Valve regulator. All lines are Nordstrom valve controlled.

FOR MAXIMUM SERVICE LIFE AND REVENUE

Rockwell Manufacturing Company has the right combination of meters, regulators and valves for any industrial setting. Engineered measurement and control groupings can be made from the most complete range of sizes and types available. For your next installation go Rockwell all the way. You'll buy maximum service satisfaction at lowest overall cost per cubic foot measured.

ROCKWELL MANUFACTURING COMPANY

PITTSBURGH 8, PA. • Atlanta • Boston • Chicago • Houston • Kansas City • Los Angeles
New York • Pittsburgh • San Francisco • Seattle • Tulsa

You Can RELY ON ROCKWELL

FOR SERVICE EASE

Illustrating how entire working mechanism of a Rockwell large capacity meter lifts from the bowl type body as a single unit for economical replacement with either a new or repaired duplicate.

There's a ROCKWELL METER and REGULATOR for every use

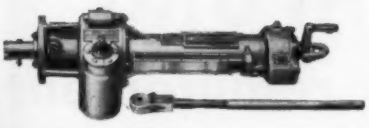
METERS

CAST IRON PRESSED STEEL

REGULATORS

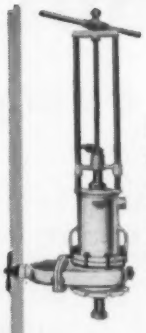
"8801"

MUELLER®



C-1 Drilling Machine

Makes 2" to 12" cuts through gate valves in any size cast iron or steel main – dry or under pressure. Power-operated with H-600 Air Motor or H-602 Gasoline Engine Drive Unit. Hand-operated model also available. Similar machines available in smaller sizes.

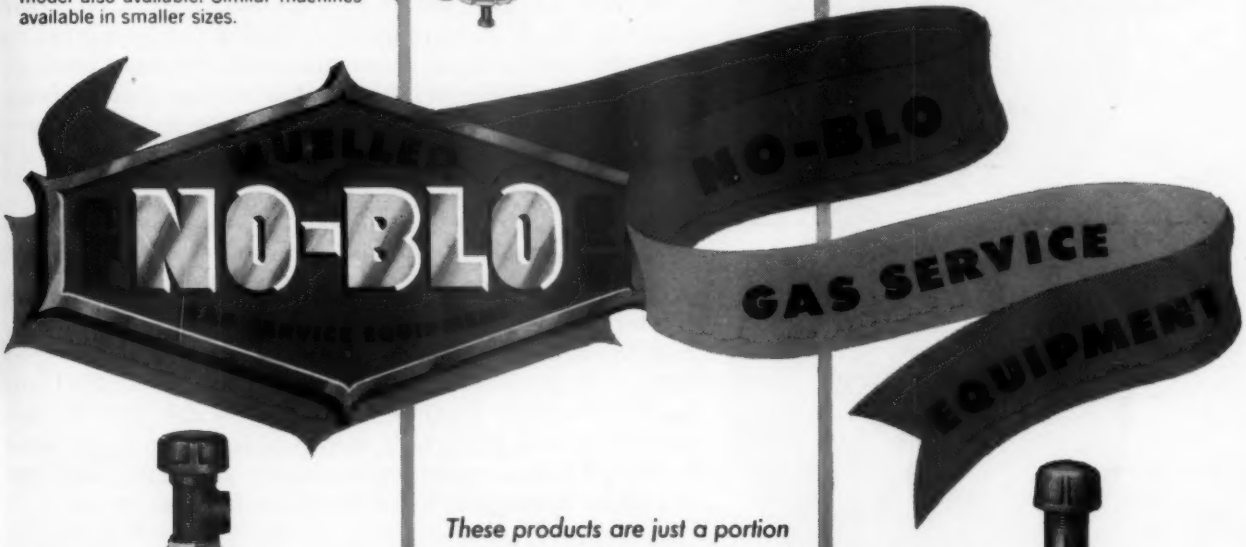


H-17340
Stopping Machine

Used to insert, expand and extract steel wedge line stoppers. Other models available for inserting stoppers ranging from ¾" through 8" under pressure.

H-17505 Flanged Tee

Used when making a large connection on a steel main. Permits locating valve on lateral line in most convenient place. Drilling and plugging of tee is done under pressure. Sizes 3", 4", 6" and 8".



H-17790
Machine Inserted Service Valve Tee

Designed for inserting directly into steel or cast iron mains under pressure, using the Mueller "B" Tapping Machine. Built-in valve gives complete control of the service at the main. Copper-encased neoprene gasket makes pressure-tight joint against pipe.

These products are just a portion of the complete selection of gas equipment, supplies and specialties offered by Mueller Co., designed and manufactured to traditionally high standards.

H-17490
Save-a-Valve Drilling Nipple

Permits removal of valve when connection is abandoned. Used when making a connection to steel pipe under pressure. Inside thread in nipple permits insertion of a plug under pressure. Completion cap makes double leakproof seal.

H-11170
LubOseal Gas Meter Stop

"O" rings are located at top and bottom of precision-ground and lapped key, assuring gas-tight seat. Lubricant is automatically pressure-fed to longitudinal grooves in key, assuring positive lubrication.

H-11104
"O" Ring Seal Gas Curb Stop

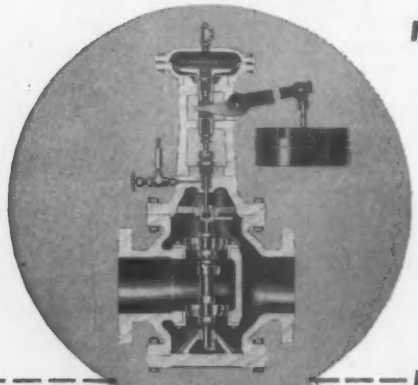
Inverted bronze key is precision ground to a gas-tight fit in a heavy cast iron body. Tight seatage is accomplished with stainless steel spring under key plus service line pressure. Seals located above and below gasway give positive assurance against top or bottom leaks.

MUELLER CO.

Dependable Since 1857

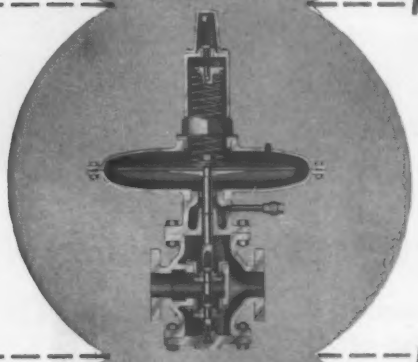
MAIN OFFICE & FACTORY DECATUR, ILLINOIS

Chaplin-Fulton
PRESSURE REGULATORS
a complete line for every requirement



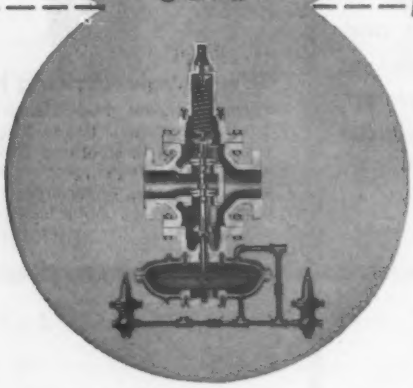
MODEL 44
Weight and Lever Loaded

For general pressure reduction service. Sizes 2″-12″ standard, 16″-24″ special. Flanged body assemblies in cast iron for 100 lb. or 600 lb. W.P.—cast steel for 1200 lb. W. P. Controlled Pressure Range—ounces to 200 lbs. All flanged construction—lubricated stuffing boxes—removable orifices—balanced valve assemblies interchangeable—hard seat, soft seat or reduced size—all center guided.



MODEL 44 S
Spring Loaded

A dependable, accurate regulator for distribution service, large industrial or commercial applications, boilers, industrial furnaces, dehydrators, etc. Sizes 2″-6″, flanged F&D 125 lb. body assembly for 100 lb. W. P. Controlled Pressure Range—ounces to 50 lbs. Can be furnished as zero governor. Removable orifices, soft seat balanced valve construction, easily adjustable and removable. Springs colored for identification.



MODEL 44 PC
Pilot Loaded

An accurate efficient pressure loaded regulator for high or low pressure service. Town border settings, compressor fuel lines, transmission measuring stations, large industrial installations. Sizes 2″-12″, flanged for 100 lb., 600 lb., or 1200 lb. W. P. Controlled Pressure Range—ounces to 400 lbs. All flanged construction. MODEL 44 PC—closes on pilot pressure failure. MODEL 44 PO—opens on pilot failure.

OTHER BALANCED VALVE TYPES

Model 44D Duplex Gas Regulators
Model 44B Back Pressure Regulators
Model 44 Diaphragm Motor Valves
Model 46 Industrial Furnace Regulators
SENSITROL Pilot Loading Systems

SINGLE SEAT REGULATORS

Little Hercules High Pressure
H. P. Field Regulator Type 101
House Regulators with Cut-off
H. P. Spring Field Type 149
Dead Weight Pressure Regulators
C-F Type 250 Safety Valves

LONG IN OPERATION • LOW IN MAINTENANCE

ACCURATE CF MFG CO *DEPENDABLE*

Chaplin-Fulton
MANUFACTURING COMPANY
Pittsburgh 25, Pennsylvania

AMERICAN Gas Journal
ESTABLISHED 1859

VOLUME 179 NOVEMBER 1953 NUMBER 6

This month...

More in pain than in anger we indited the following letter to Mr. M. W. Kiplinger, owner of the famous Kiplinger *Washington Letter*, and premier pontificater to American business on Where We are Headed and Why. We reproduce it here not to establish AMERICAN GAS JOURNAL as a tiny Horatius defending the bridge against the hordes of the competition, but rather to indicate that anyone with an interest in the gas industry had better fight like a she-bear over her cub whenever the fair name of his meal-ticket is impugned.

Dear Mr. Kiplinger:

In your *Washington Letter* dated November 14, you report that you talked to mortgage bankers in Miami, and you pass on as "advice to builders" certain impressions gathered from these conversations. However, you make one statement that we feel should be reexamined; namely, "All-electric kitchens are a must in $11,000 to $14,000 houses."

We do not think your reporters are being wittingly propagandized by the electric industry, but we do think it possible that you have used the term "all electric kitchen" when you really mean fully-automatic and modern kitchens. If this is merely a loose selection of an easy and inaccurate synonym, it does the entire gas industry a great and unjustified disservice.

Since you admonish builders to "give the buyers more for their money," you should recognize that a gas range and water heater involve, for a comparable quality, much less capital expenditure than would electric installations. And, in almost every part of the country, they will give the home buyer the same or superior service at lower operating costs.

We think very highly of your *Washington Letter;* and we bring this dubious statement to your attention because we dislike to see you become, even inadvertently, a victim of competitive promotional propaganda.

American Gas Journal

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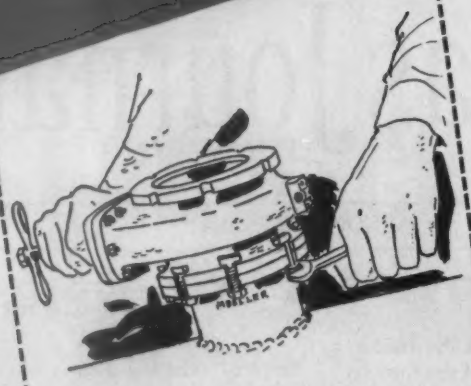
October 1 Handbook issue not sold separately.

STEP 1. WELD NIPPLE TO LINE

COMPLETION PLUG SHOULD REMAIN IN FITTING - **HAND-TIGHT** - DURING WELDING OPERATION. REMOVE PLUG AND BOLT TEST CAP IN PLACE. TEST WITH AIR AND SOAPSUDS.



STEP 2. BOLT GATE VALVE TO NIPPLE

USE ONLY THE SPECIAL MUELLER GATE VALVE WHICH SHOULD BE INSTALLED WITH SEAT RING ON TOP SO LINE PRESSURE WILL AID IN KEEPING GATE CLOSED.

STEP 3. DRILL HOLE INTO LINE

CUT IS MADE WITH A MUELLER C-1, POWER-OPERATED, OR C-C, HAND OPERATED DRILLING MACHINE. CLOSE GATE VALVE, REMOVE DRILLING MACHINE AND ATTACH LINE TO GATE VALVE. **NOTE:** BE SURE NIPPLE AND PIPE ARE COOL BEFORE STARTING CUT TO AVOID DRAWING HARDNESS FROM CUTTER.

H-17495

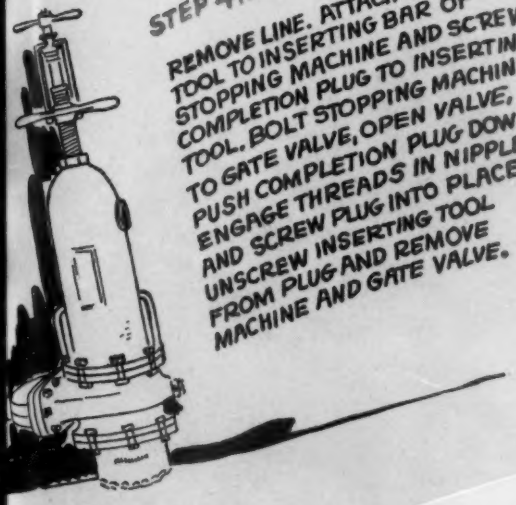
SAVE VALVES WHEN ABANDONING TEMPORARY LINES

Mueller Save-A-Valve Drilling Nipples may be used to make a connection under pressure to any tank or pipe line, without loss of fluid. In addition, they make it possible to remove and re-use expensive valves when abandoning the connection and even to re-use the connection at some future time.

This is done by using an inside thread which permits the insertion and removal of a threaded plug under pressure, effecting a tight shut-off before the valve is removed. A completion cap, which is attached to the nipple in place of the gate valve, provides a double seal and eliminates possible leaks.

Typical uses for Save-A-Valve Drilling Nipples are for gathering-line connections in the gas and oil fields, for purging and by-passing connections used with Mueller Line Stopping Equipment or other similar temporary installation.

H-17495 Save-A-Valve Drilling Nipples are made of heavy seamless steel tubing. The inlet end is machine chamfered for welding and the outlet end has a special series 15 steel flange made to be used with the Mueller H-17235 Stopping Machine and Valve. These H-17495 nipples are made in the 4" nominal size only. Other Save-A-Valve Drilling Nipples are available in nominal sizes from 1" through 3".

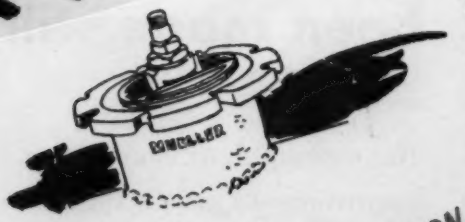


STEP 4. ABANDON CONNECTION

REMOVE LINE. ATTACH INSERTING TOOL TO INSERTING BAR OF STOPPING MACHINE AND SCREW COMPLETION PLUG TO INSERTING TOOL. BOLT STOPPING MACHINE TO GATE VALVE, OPEN VALVE, PUSH COMPLETION PLUG DOWN, ENGAGE THREADS IN NIPPLE AND SCREW PLUG INTO PLACE. UNSCREW INSERTING TOOL FROM PLUG AND REMOVE MACHINE AND GATE VALVE.

STEP 5. TIGHTEN PLUG

A SPECIAL WRENCH IS PROVIDED TO TIGHTEN COMPLETION PLUG. A PIPE OR ROD IS PLACED THROUGH THE WRENCH TO PROVIDE LEVERAGE.



STEP 7. FUTURE USE OF CONNECTION

REMOVE COMPLETION CAP AND LOOSEN PLUG. ATTACH EXTRACTING TOOL TO COMPLETION PLUG. THEN BOLT GATE VALVE AND STOPPING MACHINE IN PLACE. ADVANCE INSERTING BAR UNTIL IT CONTACTS EXTRACTING TOOL AND TURN COUNTER-CLOCKWISE UNTIL PLUG IS SCREWED OUT OF NIPPLE. RAISE INSERTING BAR, CLOSE VALVE AND REMOVE STOPPING MACHINE. LINE MAY NOW BE ATTACHED TO GATE VALVE. (STEP 3)

STEP 6. COMPLETE ABANDONMENT

WHEN PLUG HAS BEEN TIGHTENED, PLACE GASKET IN RECESS IN FLANGE OF NIPPLE AND BOLT COMPLETION CAP SOLIDLY TO FLANGE. ABANDONMENT IS NOW COMPLETE AND VALVE HAS BEEN SAVED FOR RE-USE.

MUELLER NO-BLO Method

This is another of a series of gas distribution problems and their step-by-step solution by Frank Miller, Gas Service Engineer of Mueller Co.

MUELLER CO.

Dependable Since 1857

MAIN OFFICE & FACTORY DECATUR, ILLINOIS

How the best product in its field has been made still better

Not overnight, of course—but by a series of improvements gained through research and development resulting in *modernized* cast iron pipe. Tougher, stronger pipe with standardized mechanical joints that are bottle-tight for all approved working pressures and all types of gas.

All of our member companies have centrifugal casting facilities for producing tougher, stronger *modernized* cast iron pipe. All manufacture the standardized mechanical joint with interchangeable parts—a simple, fool-proof, time-saving joint as the gas industry well knows.

If you want the most efficient and economical pipe ever made for gas distribution, your new mains will be laid with cast iron pipe—centrifugally cast and with standardized mechanical joints. Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Ave., Chicago 3.

CAST Q IRON

The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

Modernized **cast iron**

This cast iron gas main, uncovered for inspection, is in fine condition after 119 years' service in Baltimore, Md.—one of more than 45 cities with century-old water or gas mains in service.

pipe for Modern Gas Distribution

SELAS CORPORATION OF AMERICA

HEAT PROCESSING ENGINEERS FOR INDUSTRY

DEVELOPMENT • DESIGN • MANUFACTURE

ERIE AVENUE AND D STREET PHILADELPHIA 34 PENNSYLVANIA

THIS WE BELIEVE, SINCERELY . . .

that gaseous fuel today has graduated to a processing tool of more flexibility, versatility and utility than machine tools. Therefore it can govern, more than any other material, the degree of progress and stability of industry, in fact, the future of any modern technical economy and society.

BUT WE WONDER . . .

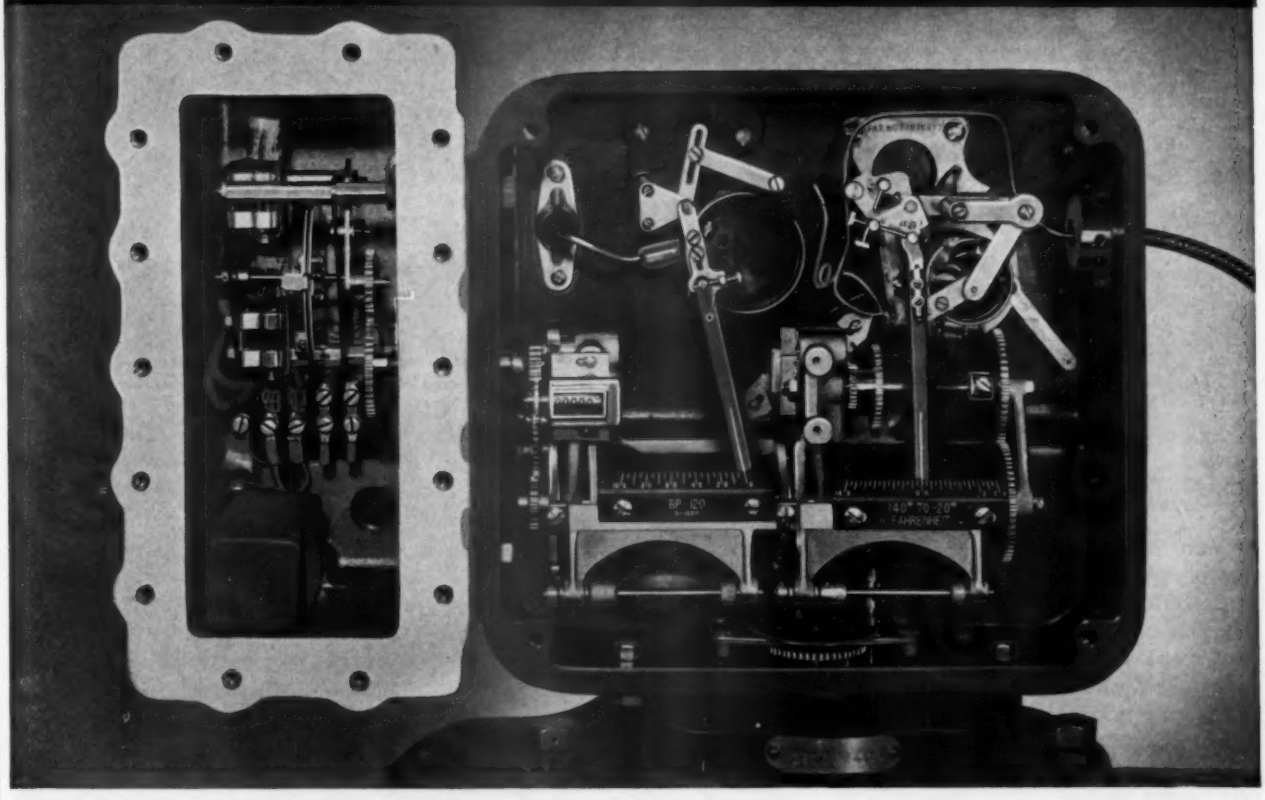
if such possibilities can be fully realized as long as gas is sold for heat processing on an interruptible basis.

Frederic O. Sass
President

SELAS CORPORATION OF AMERICA
PHILADELPHIA 34, PENNSYLVANIA
Heat Processing Engineers for Industry • Development • Design • Manufacture

NEW AMERICAN® TELECOUNTERS

for base volume indexes



Now you can read base volume indexes at any remote location

American Telecounters accurately transmit Base Volume Index indications of gas quantities, computed to base temperature and base pressure conditions, to any convenient reading station. Remote indications are read from a compact reset-type counter which installs anywhere. The counter is actuated by electrical impulses received from the transmitter housed in the explosion-proof case on the side of the Base Volume Index.

- **Reset-Type Counter only 1⅝"x 4"**
- **Explosion-Proof Transmitter Case**
- **Adapts to Large Capacity Ironcase Meters**
- **Reliable Transmission At All Times — Leased Wire, Private Wire Or Radio**
- **Power Pack Operates from Commercial 110 Volt, 60 Cycle, Single Phase Power Supply**

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AMERICAN METER CO.

AMERICAN® METER COMPANY
INCORPORATED (ESTABLISHED 1836)

When you think of...

PEAK SHAVING

for natural gas,
it's natural to think of

SEMET-SOLVAY

FIRST...

Here's why...

Pioneer in the development of regenerative and non-regenerative oil gas equipment and their adaptation for the conversion of carbureted water gas machines, Semet-Solvay Engineering Division offers you a choice of machines to function as base-load, peak shaving or stand-by equipment. These are the same types of oil gas machines that are currently setting new standards for operational economy, efficiency, and dependability at installations throughout the country.

It is natural to think of Semet-Solvay when you want oil gas equipment that—

- *is fast on the start-up*
- *can be handled with minimum manpower*
- *is capable of high thermal production for prolonged periods of operation.*

Semet-Solvay oil gas processes utilize either light or heavy grades of oil depending on their design. You're sure of satisfactory operation and a uniformly satisfactory product. Yes, as peak shaving becomes more of a necessity because of increasing commodity rates and mounting demand costs, more utility men are looking to Semet-Solvay. So when you think of peak shaving . . . when you think of high Btu oil gas processes for your natural gas operation...
it's natural to think of Semet-Solvay *first.*

SIMPLIFIED IN OPERATION

•

NO SOLID FUEL TO HANDLE

•

NO ASHES TO REMOVE

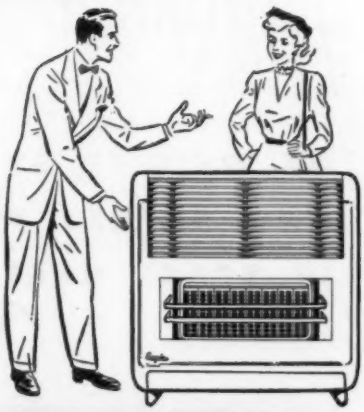
•

NO CARBON TO BURN OFF

SEMET-SOLVAY ENGINEERING DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector St., New York 6, N. Y.

Allied Chemical

Styled FOR SALES...
Priced TO SELL!



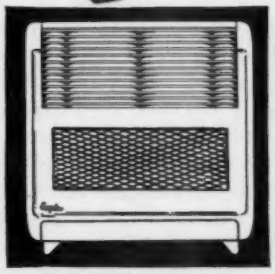
SILENT AS A KITTEN WITH AN EXTRA SET OF FOOT PADS

COOL CABINET TYPE

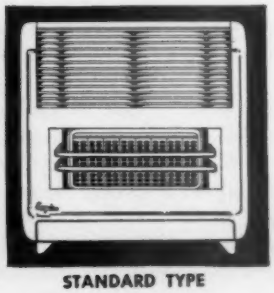
EMPIRE

COOL CABINET *Gas* HEATERS
CONSOLE TYPE *Gas* HEATERS
STANDARD TYPE *Gas* HEATERS

Take a tip from the retailers who have profit proof! Empire, the quality line, outsells all others 2 to 1. The Empire name is a powerful sales attraction. Customers know it's a brand of proven dependability, featuring modern design, skilled workmanship, and styles to suit every heating requirement for all types of homes.



NO RADIANT TYPE



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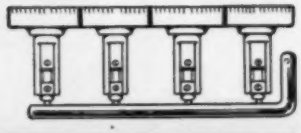

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Editorial:

The Big Boost

THE biggest boost that the Gas Industry Development Program has had since it was formally launched six months ago has just been supplied by the board of directors of the Gas Appliance Manufacturers Association, in retaining and making available without charge, professional merchandising and sales counsel to the gas utilities that have already got the program under way.

Field men from the firm of Fuller and Smith and Ross, well known throughout all industry for their market and marketing studies, are already at work with gas utilities sales departments in several cities that are pioneering in the new drive toward greater gas industry development. Before their first tour is completed they will have consulted with every one of the ten companies that are now embarked on the initial steps in the action program.

The advisability of placing marketing problems in the hands of experts for their recommended solutions has long been recognized by industry. Characteristic of any management is the inclination to believe that whatever *can be done* to develop its own particular business, is already *being done*. One of the early criticisms of the industry program was that every one of the fifteen major points on which action was recommended was met with the comment "We are already doing that," by some of the gas companies.

The answer to that from an overall industry viewpoint, or from the viewpoint of most companies for that matter, is that the net results had not, and have not to date, added up to satisfactory achievement in the larger aspects of promoting gas service and gas appliance sales.

The GAMA merchandising service, if it is to be designated as such, is not in any sense designed as an inflexible procedure that must be swallowed whole or left alone by the gas utilities. Its very essence is one of adaptability to local conditions, even to local prejudices, whatever they may be. And like the doctor's prescription, when it is finally written, the patient can take it or leave it. It is his health that is at stake, not that of the professional practitioner.

At the outset it would be rash indeed to predict the results of this new activity of GAMA. Much will depend on the cordiality and confidence with which the gas utilities meet the proffered cooperation of the appliance manufacturers. Of equal importance will be the penetration and insight that the merchandising consultants bring to bear on some of the problems that may be unique to the gas industry. Old selling clichés from yesterday's textbooks will not yield the answers.

We have voiced the opinion before, and it is equally valid now, that in the final analysis the Gas Industry Development program will have to revolve around specific plans and specific recommendations, if it is to become the needed force in rehabilitating gas industry promotional activity.

The studies of the experts, taken one city at a time, and under every conceivable condition, should lead to a broad general pattern that the specific details will follow. As the action program expands beyond the nucleus of the first ten cities that were originally designated as test areas, every new utility that joins the activity will have the benefit of the studies and findings that have been made in all of the others. In all probability it will early develop that problems that were once considered so specifically local by any one company, will be only variations of problems that are common to many others.

The new activity has the wholehearted endorsement and backing of the American Gas Association, and of the pioneering utility executives who are implementing the action program in their own areas. But if it, or if the so-called ten-city test program which initially it is designed to serve, are allowed to become the whole objective of industry development, it will be doomed to failure before the results are even in. Time has all but run out for the gas industry, unless its champions are reconciled to a dignified and orderly retreat to the cellar, with the rest of the firm domestic load laid as a votive offering at the feet of electricity.

The current Gas Industry Development Program is no batting practice for a thousand gas companies to watch while ten of their leaders sweat out the early innings of the game of survival. Nor is the new support of a merchandising service by GAMA in any sense a substitute for accelerated advertising, promotion and selling effort by the manufacturers who are GAMA members.

The need now is for every gas utility and every gas appliance manufacturer to recognize that the game is already under way—and that it will not be won by the cheering from the bleachers.

Elliott Taylor

How Long Island Lighting Co. Installed and Protected Its Underground Propane Tanks

by William F. Seewagen
Engineer
Long Island Lighting Company

LONG ISLAND LIGHTING COMPANY recently placed in service 18 LP gas tanks at the Glenwood Landing plant, with a number of unusual and interesting design-features.

The Long Island Lighting Company gas system consists of two areas, with approximately the same number of meters in each, served 537 Btu and 1,000 Btu natural gas, respectively. Natural gas is the basic fuel for both areas as the production of 537 Btu gas is accomplished by reforming the natural gas in a catalytic cracking process. The catalytic cracking equipment is located at the Glenwood plant, which is also the delivery point for natural gas.

Propane supplements oil gas for peak-shaving and standby in the 1,000 Btu area, and may be reformed to supplement carburetted water gas for the 537 Btu sendout.

The compressor equipment at Glenwood and the mains originating there are capable of supplying the entire requirements of both areas, making this the logical location for a large propane storage plant.

The 490,000 gallons of stored propane will supplement the natural gas supply for peak-shaving or emergency. Because the plant is near a residential area and adjacent to two bathing beaches on Hempstead Harbor, appearance was a major consideration. The subsoil is clean sand, enclosed in a steel bulkhead, and well-drained. Estimates showed that the cost of placing the 30,000-gallon tanks underground would be greater that a standard aboveground installation. In consideration of the better appearance and lower maintenance costs over the years, it was decided to cover the tanks with 18″ of clean, fresh-water-washed sand.

Although the overburden of fill would theoretically prevent the tanks from floating, if they were empty during the highest tide level recorded to date, it was believed desirable to bolt the saddles to piled concrete foundations. Continuous concrete foundations under the tank saddles at each end were provided with 4 piles per tank. The bottoms of the tanks are located approximately 2′ above mean high water level. The normal grade for the area is such that the tanks are buried to the longitudinal center line and mounded over with clean sand fill to provide a minimum of 18″ of cover. A concrete walkway giving access to the manways or "working ends" of the tanks forms a protective cover and insulation in lieu of the sand at these locations.

Coating and cathodic protection

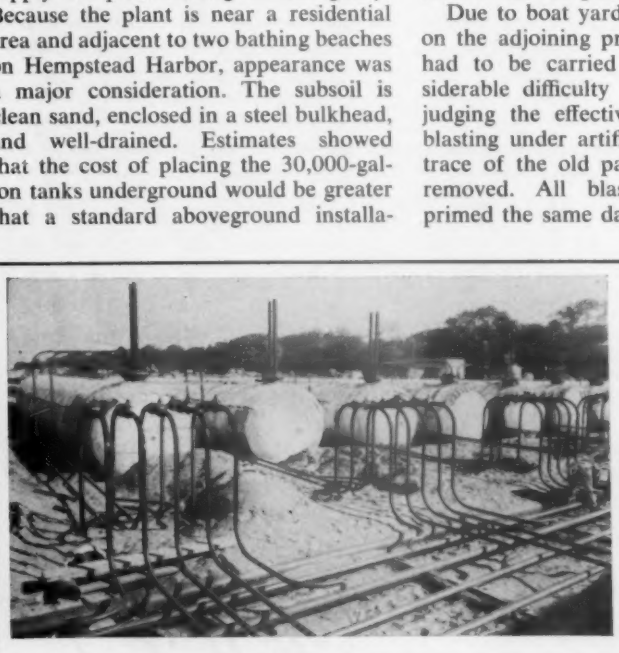
Inasmuch as these tanks had been in previous LP service for several years as a typical aboveground installation, the exterior surfaces were sandblasted to remove all old paint prior to coating.

Due to boat yard painting operations on the adjoining property, sandblasting had to be carried on at night. Considerable difficulty was encountered in judging the effectiveness of the sandblasting under artificial light, but every trace of the old paint and primer was removed. All blasted surfaces were primed the same day.

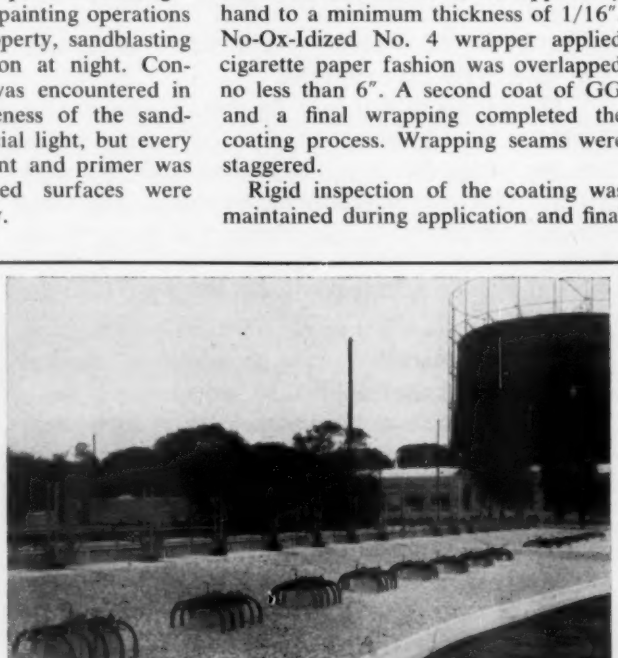
WILLIAM F. SEEWAGEN is an engineer for the Long Island Lighting Company where he has been employed since his graduation from Polytechnic Institute of Brooklyn in 1938. After serving several years in the steam electric generating stations of the system, a transfer to the mechanical engineering department in 1942 provided experience in design of both gas and electric production facilities. Since 1947, design of LP and natural gas handling plants has occupied much of his time.

A cold-applied wax type coating and membrane wrapper applied in double layers was selected because it is more pliable than an enamel coating, which it is believed might crack due to expansion and contraction of the tank shell under pressure and temperature changes. The cold coating also is much easier and quicker to apply on large surfaces than a hot-applied coating. The wax compound (No-Ox-Id GG) is supplied by Dearborn Chemical Co., was applied by hand to a minimum thickness of 1/16″. No-Ox-Idized No. 4 wrapper applied cigarette paper fashion was overlapped no less than 6″. A second coat of GG and a final wrapping completed the coating process. Wrapping seams were staggered.

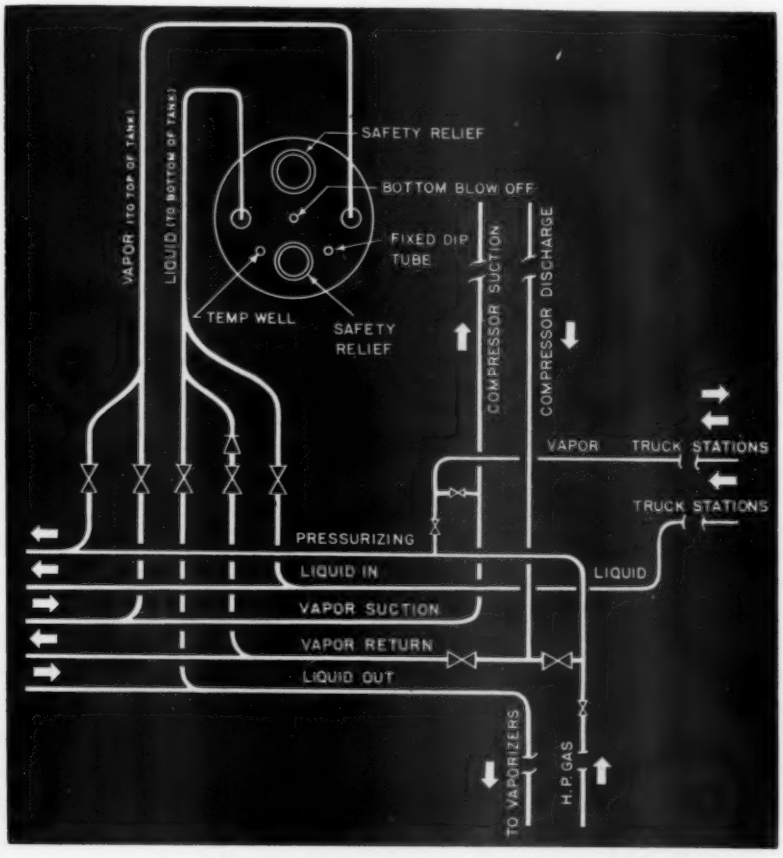
Rigid inspection of the coating was maintained during application and final



Piping, above, before backfilling operations, showing the shop-fabricated bends that give maximum flexibility. Right, the propane storage area looking toward manway ends of tanks, showing manifold piping and concrete walkway along tank manway covers.



Note high curb that retains sand covering and encloses tank area.



Schematic piping arrangement and tank connections for Long Island Lighting Company's underground propane storage.

test was made with a holiday detector at 12,000 volts. Sealtight Pipe Shield, over the upper tank surface, protected the coating during back-filling operations.

Coating operations were performed in very hot weather. A coat of whitewash applied to the top surface reflected the summer sun rays and reduced the tendency of the wax coating to soften and run off.

Cathodic protection on each tank consists of 6 package type, 17 lb. magnesium anodes equally spaced with 3 anodes on each side of each tank. Connections to each anode and the corresponding lead from the tank are brought up to curb boxes for convenience in making a periodic potential check. Underground piping is protected in a similar manner. The anodes also serve to ground the tanks electrically.

Piping and tank connections

Provision was made for receiving truck shipments and future extension of headers to the bulkhead to handle deliveries by car float or tanker. There is no railway siding at this plant. Three trucks may be unloaded simultaneously on a paved roadway within the storage area. Unloading operations can use either tank-truck liquid pumps, vapor compressors for differential pressure unloading or pressurizing the truck tank from high pressure gas main.

All tank connections except the magnetic liquid level gauges are made through the manway covers. A fixed dip tube, calibrated for maximum permissible filling capacity, is mounted in the cover, which also carries a thermometer well and bottom blow-off connection. There is a single liquid connection and a single vapor connection in each manway cover.

The vapor and liquid lines are connected to five underground manifolds as shown in Figure 1. The liquid connection terminates 4″ from the tank bottom and is used to transfer liquid in either direction. Flow outward from the liquid connection is limited by a 3″ excess flow valve within the tank. A 1¼″ excess-flow valve in the vapor connection permits unrestricted vapor flow into the tank and allows controlled flow out of the tank. The connection through the bottom of the shell was plugged and seal-welded.

The anticipated routine operation requires a maximum of approximately 125 psig pressure at the vaporizers. During the several months that propane has been in storage, a steady average temperature of about 63°F within the tanks has been recorded. It is estimated that year-'round ground temperature changes will produce internal tank temperatures between 55°-and-65°F. Under these conditions, the vapor pressure due to temperature normally will be sufficient to deliver liquid to the vaporizers without the necessity for additional pressurizing. It is anticipated that if additional pressure is required, it will be furnished by use of the 6 vapor compressors, boosting pressure from one tank to another. A high-pressure gas pressurizing line is provided in the design but is not intended for routine operations. Natural and manufactured gas are partially soluble in propane and contaminate the propane.

The vapor return header permits the recovery of vapor from delivery trucks or tanks by pumping the recoverable vapors with the vapor compressors and discharging into the storage tanks below the surface of the liquid.

The Schedule 80 tank-to-manifold piping was shop fabricated, permitting the use of long-radius bends instead of standard welding fittings. This design resulted in a flexible piping system which permits maximum physical distortion without damage. Another effect was to minimize the number of welds.

Sectionalizing valves in the manifolds divide the tanks into two groups. The two 3″ liquid transport lines are also sectionalized approximately every 200′. Total distance from tanks-to-vaporizers is about 800′. In lieu of a single 4″ liquid transfer line of this length, two 3″ lines were believed to give greater flexibility of operation and to minimize the hazard in case of a line rupture.

Safety devices and fire protection

The use of Shand and Jurs remotely-controlled hydraulic valves makes it possible to shut down the system automatically by simultaneously closing

(*Continued on page 34*)

Tank connections through manway cover and water spray nozzle (white arrow) to protect exposed surfaces.

Technique and Application of New Capacity Credit Method

by Hans E. Nissel
Partner
Foster Associates

THE basic principles of cost allocation for public utilities were discussed in the October 15 issue and a new method for allocating capacity cost to the different customer-classifications of gas transmission and distribution systems was proposed. This new Capacity Credit Method has the essential innovation of introducing capacity credits at various stages of the capacity-cost assignment.

Hans E. Nissel

This article explains more fully the technique and procedure followed in the determination of capacity charges to the various classes of service and shows how the capacity credits eliminate the inconsistencies inherent with other methods.

The allocation of capacity-cost by this method is based on the use made by the different customer-classifications of capacity available throughout the year. The Capacity Credit Method assigns to all customer-classifications the capacity used by them and unused capacity for which they are to be held responsible, granting capacity credits to customers who vacate capacity, by virtue of their load conditions or by curtailment, and who make it available for use by other customers.

The method proceeds basically in two steps. In step one, the capacity responsibility of firm customers is established by assigning to them capacity used, and the unused capacity created by them. In step two, capacity is charged to interruptible customers to the extent that it is used by them, less an appropriate credit for curtailment, and an equivalent credit is given to firm customers in proportion to the unused capacity initially assigned to them.

IN THIS ARTICLE, Mr. Nissel explains in detail the technique of the Capacity Credit Method, the principles of which he exposed in our October 15 issue, under the title of, "New Capacity Credit Method Provides for Allocations of Costs in Gas Systems." He has studied the problems of capacity cost allocation for many years and his first critical analysis of this subject, which pointed in the direction he has followed, was published in 1931. Since that time, he has introduced several improvements of methods previously used, leading finally to this Capacity Credit Method.

This procedure, in two steps, is necessary in order to permit application of this method to systems with firm customers of different load factor and interclass diversity, and to retain its validity under unusual and extreme load conditions.

Since cost-allocation must be based on actual operating conditions, it is irrelevant for the application of this method whether curtailment of interruptible sales is under the jurisdiction of the pipeline company in accordance with the conditions of the tariff, or is effected by the distribution utilities under their own responsibility. The only criterion for classification is the operation of gas supplies under firm or interruptible conditions, respectively. Firm deliveries create definite capacity requirements and hence responsibility for unused capacity. Interruptible supplies have no definite capacity responsibility since they are using idle capacity initially provided for firm customers, as and when it is not used by them.

Responsibilities of firm customers

Capacity responsibilities of firm customers are determined by a modification of the so-called complete peak method. This method was proposed by Oram and Robison[1] in 1928 for application to the maximum daily load curve of an electric utility and did not give consideration to seasonal load fluctuations which have become of predominant importance to gas utilities, nor to the peculiar conditions of interruptible supplies. It is well known that not only the complete peak method but also the other methods for capacity-cost allocation, all of which were designed with the conditions of electric utilities in mind, are seriously defective when applied to gas utilities where heavy seasonal load fluctuations and interruptible supplies have to be considered.

In order to overcome the first obstacle and give weight to seasonal load fluctuations, the author uses a technique that permits application of the complete peak method principles to load conditions throughout the whole year. The second problem, posed by interruptible customers, was solved by introducing the capacity credit concept.[2]

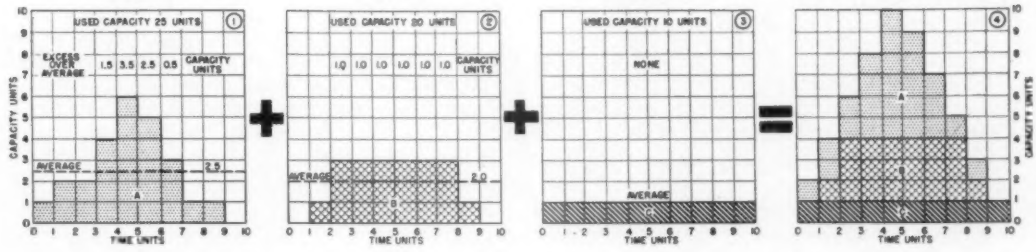
The technique of the Capacity Credit Method may be explained by reference to Graphs 1-through-12, as follows: Graphs 1, 2 and 3 are diagrams of three firm component loads having a load factor of about 42%, 67% and 100%, respectively. For convenience sake, the abscissae which may represent 365 days or 8,760 hours, are divided into 10 time-units. Similarly, the ordinates, indicating the demand in Mcf or therms are divided into 10 capacity-units, each of which equals 10% of the maximum system demand. Used capacity, average load and excess of demand over average load, which serves subsequently as yardstick for allocating unused capacity, are indicated on each of these three graphs. The composite load diagram is shown in Graph 4.

The loads during the different time units are now arrayed in descending order of magnitude, to form the load-duration diagram, shown in Graph 5, and order numbers are assigned to them. The time-units applying to Graphs 1-through-4 are entered in Graph 5 for easy reference. Of the 100 units of capacity available during the 10 time-units, 55 units are used and 45 units are unused. The average system load of 5.5 capacity-units is exceeded during 5 time-units which constitute the complete peak. The unused capacity, consisting of 32.5 units above system average and 12.5 units below system average, has to be assigned first to the time units forming the complete peak. For the un-

[1] *Electrical World*, 1928, vol. 92, p. 359.

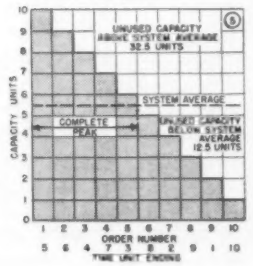
[2] This procedure, applied to production and distribution capacity, was used in 1951 in the preparation of a cost analysis for a gas distribution company submitted as evidence in a rate case before the Illinois Commerce Commission.

FIRM COMPONENT LOADS



LOAD DURATION DIAGRAM

Graph 5



used capacity above system average the partial plant method is used. This method considers the capacity necessary for satisfying the peak load divided into a number of partial plants, each required to supply an incremental fraction of the load and each being used during a decreasing span of time.

The Capacity Credit Method considers as partial plants the differences in load between consecutive days, or hours, as arrayed in descending order of magnitude. In the present example, these differences amount to one capacity-unit for the time-units with the order numbers 1 to 4, and one half of one capacity-unit for the fifth time-unit, as indicated in Graph 6.

The partial plants are numbered p_1 to p_5. Partial plant p_1 is used during one time-unit only and unused during 9 time-units. The 9 units of unused capacity are therefore charged to the one time-unit during which this partial plant is used. The 8 unused capacity-units of partial plant p_2 have to be shared between the two time-units during which it is used. The unused capacity shares are numerically entered in Graph 6.

For the unused capacity below system average, the time-units using the remaining partial plants (not numbered) are not equally responsible. Since, for every unit of unused capacity below average, there is an equivalent unit of used capacity above average—this being the meaning of average—each time-unit has to bear the share of unused capacity below system average equivalent to the excess over the system average during such time-unit. This is illustrated in Graph 7. The time-unit with the order number 1 is, therefore, responsible for 4.5 units of unused capacity, the second time-unit for 3.5 units, and so forth as shown in Graph 7.

In Graph 8, the load-duration diagram is broken down into the three firm component loads, and the average of loads A and B is entered, so that the excess of their capacity requirements over the average during each time-unit can be read. Graphs 9 and 10 represent the unused capacity above and below system average, which was entered numerically on graphs 6 and 7, respectively.

Graph 11 shows the total unused capacity assigned to the 5 time-units forming the complete peak which has to be shared among the three loads, A, B and C, in proportion to the excess of their demands over their individual averages. Coordinating Graphs 8 and 11, the 21.83 units of unused capacity assigned to the time-unit with the order number 1, have to be shared between A and B in the proportion 3.5-to-1. The 11.83 units of unused capacity assigned to time-unit 2 are shared between A and B in the proportion 2.5-to-1. Load C is not assigned any unused capacity, since it never exceeds its average load.

In application of the Capacity Credit principle, load A is given credit for 0.5 unused capacity-unit during the fifth time-unit of the complete peak, since its demand at this period is below average by this amount. The same amount is charged to load B, offsetting the credit to A. This shift of unused capacity from A to B is justified by the fact that A, by virtue of its being below average, relieves B during this time-unit of unused capacity equal to (or, if it were happening at a time of higher system load, greater than) the credit given. The shares of unused capacity assigned to the loads A and B are entered in Graph 11.

In the accompanying table, used capacity as shown on Graphs 1, 2 and 3, and unused capacity as summarized from Graph 11, are entered in columns 2 and 3, respectively. The totals of used and unused capacity, representing the capacity responsibilities of the 3 firm loads, are given in column 4. Average capacity responsibility per unit of used capacity (or commodity) is shown in column 5.

The 100% load factor customer bears the unity charge. This is equivalent to the cost of capacity preempted by him, 365 days per year. Loads A and B receive a higher charge, depending not only on their load factors but also their load characteristics throughout the complete peak. Assignment of unused capacity by this method would be obviously greater to a customer whose maximum demand coincides with the system maximum demand, than to a customer having the same load factor, but with his maximum not coinciding with the system peak.

Interruptible customer credits

After capacity responsibilities of firm classes of service are determined by this method, capacity is charged to interruptible customers. Capacity used by interruptible customers is part of the unused capacity created by and initially assigned to, firm customers. Therefore, to the extent that capacity is used by interruptible customers, it is transferred to them at the unity cost of used capacity less credit for curtailment. As with firm customers, the credit is based on the deficiency of supplies below average supplies. The procedure and the results obtained are demonstrated by Graph 12.

In Graph 12, four interruptible loads with different degrees of curtailment are fitted into the load-duration diagram of the three firm loads. Load D is curtailed 10% of the time; load E, 20%; load F, 30% and load G, 40%. The average of these four loads over the whole period of 10 time-units, expressed in capacity units is 0.9, 0.8, 0.7 and 0.6, respectively. Like the firm loads, these interruptible loads are charged with used capacity, and receive credit for the amount by which supplies to them, at any time, are below average.

The respective charges for used ca-

(Continued on page 30)

EL Paso's Navajo Compressor Station

NATURAL gas, moving from the San Juan Basin, New Mexico, to distribution systems in California, is being compressed at one of El Paso Natural Gas Company's stations by equipment that is fueled directly from the 24″ pipeline. The station, located in the Navajo Indian reservation of Arizona, was the first in service on the 423-mile line from the Basin to Topock, Arizona, where gas is fed into lines of Pacafic Gas and Electric Company.

When all presently planned construction on the line is completed, there will be four stations handling 267 MMcf per day, but for more than a year and a half the Navajo station has carried the entire 167 MMcf daily load. The station went into service in 1951 with a combined rating of 3,950 hp, operating at an elevation of 6,800′. As the gas field was brought in, the operating schedules for the original five engine-compressors was increased steadily until they were in virtually continuous service. In January, 1953, the plant average for operation was more than 97%, with the engines developing 96.8% of available brake horsepower hours.

Work on the installation of five additional compressors was begun in January, the first two units being in operation by February. This expansion, while adequate to handle the projected 267 MMcf per day, does not represent the maximum for El Paso Natural Gas or for the Navajo station. Permission has been sought for construction of facilities, costing more than $175 million, that will further increase main line delivery capacity by 400 MMcf per day. This project will include a 30-inch pipeline from the Permian Basin to a point near Gallup, N. M., where it will join the 24-inch line from the San Juan Basin. The 30-inch line will then parallel the San Juan line westward and connect at the far western section of the San Juan line.

Navajo station will get additional, larger engine-compressors, during the planned expansion, which will raise total capacity to 14,000 horsepower. Presently, from the company's San Juan River plant, gas moves 138 miles through the 24-inch line to Navajo, reaching that station at a pressure of about 500 psig. The gas is compressed and discharged at approximately 845 psig, sufficient to move it 285 miles to Topock.

Gas enters the station through three suction valves, one to the bypass line and the other two leading to a pair of horizontal scrubbers. Suction and discharge valves are shut off automatically by solenoid-controlled gas cylinders in the event of a drop in gas pressure or a power failure, although emergency shutdown can also be actuated by a central push-button control. The valve that bypasses the station is manually controlled.

A means for putting oil into the scrubbers while they remain in operation permits an oil flow by gravity from a pair of elevated supply tanks into a small header connected to the scrubbers by a 2-inch line and T-connection. Gas from the station discharge header is then admitted to the oil header and forces the oil into the scrubbers.

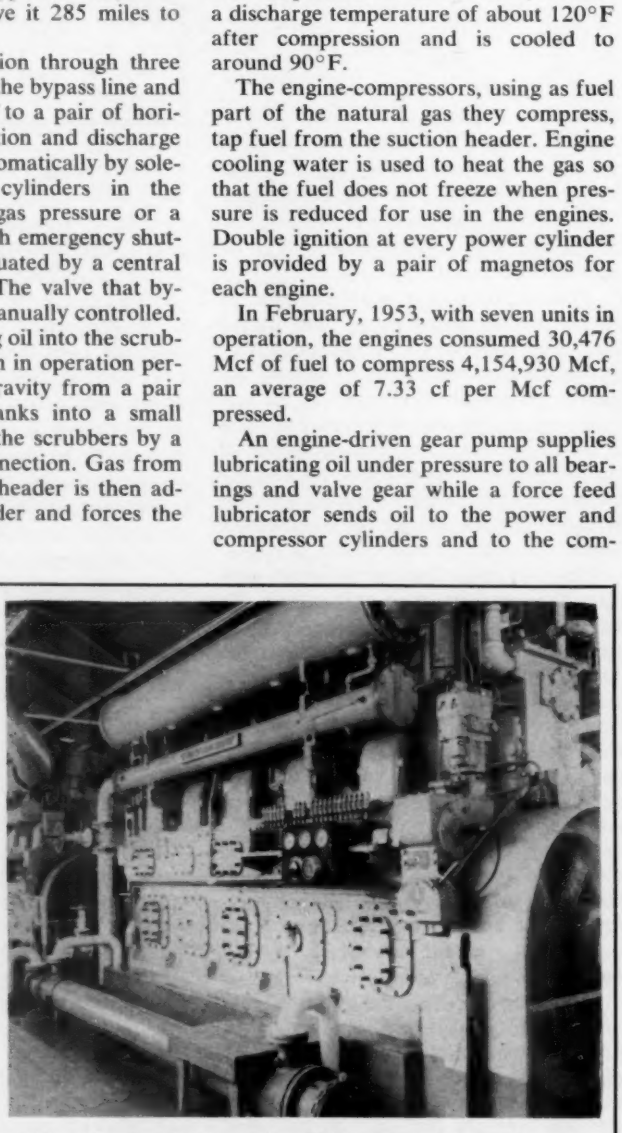
After cleaning in the scrubbers, the incoming gas goes to the suction header and through individual lines and valves to the engine-compressors. Each of these, Worthington Uniflo, has five vertical power cylinders of 16″ bore and 16″ stroke driving three horizontal compressor cylinders of 8½″ bore and 16″ stroke off the same crankshaft. Operating at 320 rpm, this engine has a sea level rating of 1,000 hp, but is derated to 790 hp, at Navajo's altitude.

From the compressors, gas goes to the station's discharge header and then through an induced-draft, dry air cooler before leaving the station through the discharge valves. Gas comes in at a suction temperature of about 48°F, reaches a discharge temperature of about 120°F after compression and is cooled to around 90°F.

The engine-compressors, using as fuel part of the natural gas they compress, tap fuel from the suction header. Engine cooling water is used to heat the gas so that the fuel does not freeze when pressure is reduced for use in the engines. Double ignition at every power cylinder is provided by a pair of magnetos for each engine.

In February, 1953, with seven units in operation, the engines consumed 30,476 Mcf of fuel to compress 4,154,930 Mcf, an average of 7.33 cf per Mcf compressed.

An engine-driven gear pump supplies lubricating oil under pressure to all bearings and valve gear while a force feed lubricator sends oil to the power and compressor cylinders and to the com-



Above, 10 Worthington Uniflo angle gas engine-compressors. The five in the foreground have been in service since September, 1951, and handling 167 MMcf per day. Right, a view of the engine-compressors showing the power side of the gas engines.

Uses Pipeline Gas For Engine Fuel

pressor stuffing boxes. Included in the pressure system for each engine is a lube cooler, a full-flow strainer and a by-pass waste-packed filter. Lube oil also is used effectively to cool the pistons.

Four motor-driven centrifugal pumps circulate engine cooling water through the engine jackets and through eight coil sections of a dry-type cooler served by two motor-driven fans. A thermostatically-controlled valve bypasses water around the cooler as necessary to maintain desired jacket temperature. Three motor-driven centrifugals circulate water through the lube coolers and four coil sections of the dry cooler served by a single fan. All makeup water is treated in a softener before being supplied to the cooling system by a separate make-up pump.

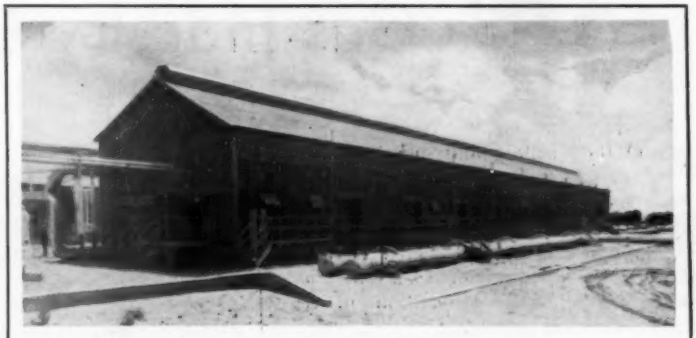
Scavenging air for the two-cycle Uniflo engines is drawn through an intake snubber and filter for each unit. Air enters the power cylinder through ports around the entire circumference of the lower end of the cylinder and sweeps the exhaust gases out through the exhaust valves in the cylinder head. From the exhaust header, the spent gases vent through a vertical snubber outside the plant.

Navajo station is self-sufficient and electricity for plant lighting, operation of motor-driven auxiliaries, and domestic use in the homes of operating personnel is supplied by a pair of Worthington gas engines, each of which is rated at 353 hp, at that elevation. Each engine drives at 450 rpm a 245 kw synchronous generator with 7.5 kw belt-driven exciter mounted over the outboard bearing.

One engine handles the load, with the second providing standby protection and they are alternated in service. In February, 1953, one engine ran 335 hours, the other 337 hours for a total production of 109,000 kwhr. Fuel consumption was 1,428 Mcf of natural gas with an engine load that averaged less than 50% of sea level rating. Lubricating oil consumption was low with the engine averaging more than 14,000 rated hphr per gallon of lube.

Included in the auxiliary building are a switchboard, a control center for all electrically-operated plant auxiliaries, accessory equipment for the engine-generator sets, the pumps for the plant cooling water system, and three air compressors, two motor-driven and one driven by a gas engine.

Navajo Station, well into its second year of service, each of the original engine-compressors already has topped 10,000 hours of operation.



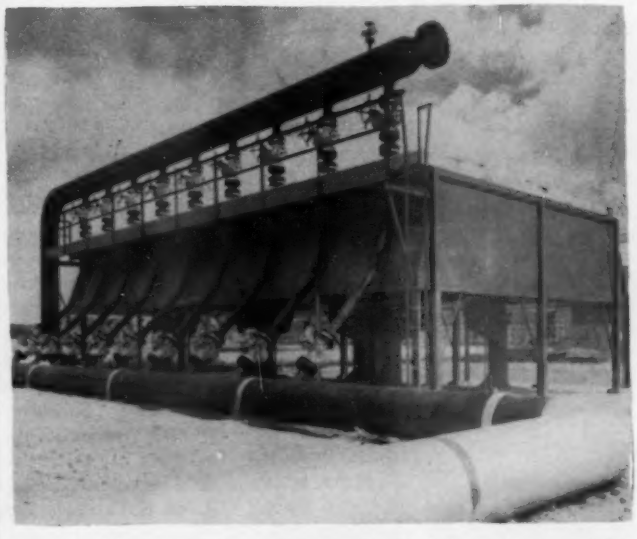
The Navajo station of El Paso Natural Gas Company.

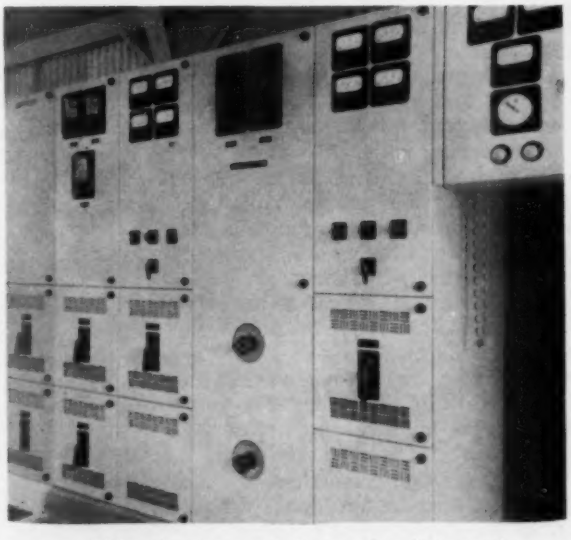
TURBINE COMPRESSOR DATA GIVEN AT AGA CONVENTION

At the convention of American Gas Association, last month, E. A. Walsh, engineer, El Paso Natural Gas Co., made a presentation to the operating section on gas turbine driven centrifugal compressors for transmission pipelines. The purpose of the discussion was to present to the convention available statistics relating to the operation and performance of the compressors based on experience.

EL PASO COMPARISON OF RECIPROCATING AND GAS TURBINE COMPRESSOR STATIONS

	Reciprocating	*Gas Turbine*
Total direct construction	$235.00/brake hp, installed	$198.88/brake hp, installed
Labor, manpower	27	5
Fuel	10.83 cf/brake hp, developed, includes main engine & auxiliary power	10.5 cf/brake hp, developed, includes turbine & auxiliary power
Oil	2,700 brake hp hrs/gal	30,000 brake hp hrs/gal
Water	135 gal/min	30 gal/min
Maintenance	$2.14/installed hp/year	Not determined
Auxiliary power	520 kw	400 amp hrs battery
Total direct operating	$22.20/installed hp/year	$8.25/installed hp/year





After compression, natural gas in the discharge line is cooled in this Fluor dry cooler, above. At the right, in auxiliary building, a power switchboard and the control center for all electrically-operated plant accessory equipment in El Paso's Navajo station.

Gas Industry Development Program

SOUND selling and merchandising of gas service and the appliances through which it is delivered again dominated the thinking and discussions of the 3,000 delegates who assembled for American Gas Association's 35th anual convention in St. Louis, October 26-to-28.

Keynoting the three-day meeting, President Frank C. Smith developed, as the theme of his address, that the industry is on its way up in a new spirit of unity and determination that has found its tangible expression in the Gas Industry Development Program, sponsored by both AGA and Gas Appliance Manufacturers Association during the past year. Commenting on the evolution of the program, the speaker recalled that in the studies conducted by the directors of the two associations, "startling and disturbing facts were revealed, and definite needs for improvement clearly indicated, in the fields of appliance merchandising and sales promotion, appliance servicing, appliance development and utilization, and customer and public safety."

"In the various meetings of the association, and many others I have attended during the year," he said, "I have noted a quickened pulse and a receptive attitude as our theme of this year has been sounded. . . . We may take heart and courage in these evidences of heightened interest and affirmative attitudes. We may at least assume that the road of progress is marked and our destination known."

In summary, President Smith said that "this year may be regarded as a year of decisions made, of plan adopted and program begun, and of an industry-wide realization and preparation for action, which I fervently hope and dare to believe will become the mainspring and prime mover of our future progress."

President-elect Earl H. Eacker, president, Boston Consolidated Gas Co., carried forward the selling theme in his luncheon address before the industrial and commercial gas section of AGA, when he addressed himself to the subject of Sound Selling Creates Sound Public Relations. "Sales and good customer relations are the foundation stone of any industry," he said. "They are what the gas industry needs most today and will need most in the future."

Pointing out that commercial and industrial gas sales are very much a vital part of the development program, despite the fact that initial emphasis has of necessity been on domestic appliances, Mr. Eacker summarized commercial and industrial sales over the past 20 years as: (1) growing from 55% of the therm sales in 1932 to 63% of the total in 1952; (2) increasing gas consumption to 5.7 times the 1932-volume as compared to 3.7 times increase in domestic volume; (3) growing from 25% of total gas revenues in 1932 to 39% in 1952; (4) more than triple the per-customer gas load, compared to a 125% increase in gas sales per residential customer.

Urging continued and closer cooperation with dealers, Mr. Eacker told members of the section, "The fortunes of the gas utility industry and the gas equipment manufacturers and dealers of gas equipment are dependent on each other."

James F. Donnelly

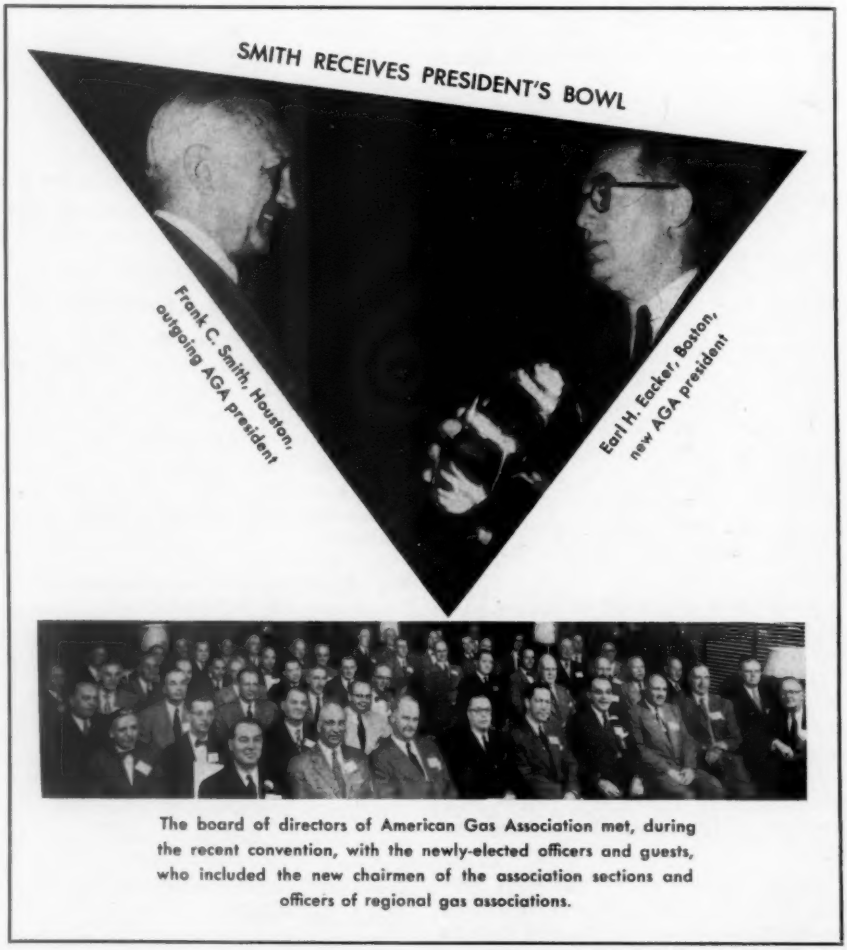
Speaking for the manufacturers, and representing GAMA of which he has been president for the past year, James F. Donnelly, vice president, Servel, Inc., emphasized that the manufacturers of appliances and equipment are squarely behind the Gas Industry Development Program.

"Right now," he said, "the plan for our course of action has been painstakingly blueprinted. Each one of us must lend his full support to the execution of these blueprints into a force of action."

GAMA has recently completed a survey on industry-thinking regarding 1953 and 1954 volumes, which were summarized briefly by Mr. Donnelly, who also expressed his personal conviction that 1954 appliance sales will exceed the present estimates of GAMA manufacturer members. In general, most manufacturers expect 1954 sales volumes to be about equal to those of 1953.

The outgoing GAMA president also spoke in glowing terms of the good that has been accomplished for the whole gas industry by the GAMA public relations program.

"We are getting results," he said, "the



The board of directors of American Gas Association met, during the recent convention, with the newly-elected officers and guests, who included the new chairmen of the association sections and officers of regional gas associations.

...olds Top AGA Convention Interest

public is stirring and becoming gas-conscious. There is an ever-increasing stream of gas appliance publicity appearing in newspapers, magazines, TV and radio. . . ."

Reverting in his closing, to the Gas Industry Development Program, he said, "Just one word of caution—a speech, a program on paper, are only words . . . words themselves cannot produce the action needed . . . to accomplish results we must individually act and work . . . there is no easy way out."

Regulation, at both the national and state levels, were discussed by two speakers, Jerome K. Kuykendall, new chairman of Federal Power Commission and Eugene S. Loughlin, chairman of Connecticut Public Utilities Commission.

Jerome K. Kuykendall

Chairman Kuykendall, disclosing the fact that 51 rate cases were pending before the commission, said that it was FPC policy to get rate cases settled as expeditiously as possible.

"We are fully aware of the undesirability of rates being collected under bond and being subject to refund," he said.

Indicating a personal and an official understanding of the plight of many of the natural gas companies, caught between rising costs and static rates, Mr. Kuykendall also declared, "The Federal Power Commission has no authority to compel a utility under its control to absorb the additional expenses brought about by inflation and to render the customer of the utility immune from them. . . . This is as it should be. It would be no more sensible or equitable to freeze utility rates at a level which would impoverish the utilities than it would be to freeze farm prices at a level that would impoverish the farmers."

On rate of return, as related to securing additional capital for industry expansion, he said, "A regulatory commission has an obligation to maintain a regulatory atmosphere which will give the investor enough confidence to let his money be used in enterprises which are regulated by the commission."

Arguing that the best way to keep government out of business would be for business to supply its customers with as much value for as little money as was consistent with sound economics, Mr. Kuykendall stated, "Whether or not we have more public ownership of utilities will depend largely on the fairness and effectiveness of the regulation of the privately-owned utilities and the willingness and ability of the privately-owned utilities to render adequate service at just and reasonable rates and meet the ever-increasing demands placed upon them."

Eugene S. Loughlin

Connecticut Commissioner Loughlin, in an address on States Rights—Its Privileges and Responsibilities, took the view that the pendulum of the Federal policy of extending its jurisdiction into state spheres "has now reached the end of the course it has been tracing for the past 25 years." But he also warned that, "it is more vital than ever that the states be prepared to take over the responsibilities" that will follow.

"The field of utility regulation as practiced in the states," he summarized, "represents a typical example in which the virility of state government will be assured only so long as it is able to demonstrate a record and a promise of sound and impartial regulation in the public interest."

Hines H. Baker

An able brief for a more realistic approach to natural gas rates, and the elimination, once and for all, by specific legislation of the threat of FPC regulation of production and gathering of natural gas was contained in the speech of Hines H. Baker, president, Humble Oil and Refining Co., titled Natural Gas in the Future.

Mr. Baker pointed out that a changed relationship between the demand for natural gas and natural gas reserves has been apparent since World War II. "Since 1945 the demand has doubled, while proved reserves have increased by only one-third."

Whereas in 1952, proved reserves were at a level of about 20 times the annual rate of production, he prophesied, "If the same rate of growth in demand and in proved reserves experienced during the past six years should continue, proved reserves by 1958 would be only 15 times the annual rate of production. . . . Such a development would pose a major problem with regard to adequate supplies of natural gas for the future."

Pointing out that the threat of Federal control over production and gathering has already discouraged natural gas companies in their exploration and development efforts, and materially restrained the sale of natural gas for movement in interstate commerce, the speaker asserted that nothing short of congressional legislation can resolve the problem. Such legislation should prevent FPC from (1) regulating the production and gathering of natural gas; (2) fixing or regulating the price at which a producer of natural gas sells his gas to a natural gas company; and (3) fixing the rates of a natural gas company below a figure that will allow as an expense the actual price paid for gas purchased from non-affiliated production, or the market price of fair and reasonable value in the field. . . ."

Other scheduled events of the convention included meetings, panel discussions and speakers on technical, accounting, management, and home service problems of the industry.

West Coast group at the American Gas Association convention: left to right, Edward Kern, assistant managing director, and Clifford Johnstone, managing director, Pacific Coast Gas Association; William Moeller, Jr., retired vice-president, Southern California Gas Co., Los Angeles; Arthur Theobald, chief engineer, Sequoia Manufacturing Co., San Carlos, Calif.; and Grove Lawrence, vice-president, Southern California Gas Co., Los Angeles.

Skies Bright for Bond Financing

Economists See No Clouds on the Horizon

by John F. Falvey

Financial Editor

BOND prices have staged a sharp recovery in recent weeks, and interest rates have declined all along the line. This is in reflection of a number of factors, in the forefront of which have been the Federal Reserve Board's change-about toward an active, easier money policy and the action of the Treasury Department in offering only short-term securities. In this manner Treasury is avoiding a repetition of the competition with corporate borrowers for long-term funds which so badly unsettled the bond market early this year.

John F. Falvey

Taking advantage of the better bond market, a goodly number of utility managements have accelerated their financing schedules. Instead of continuing to finance expansion through use of bank credit, as they originally planned to do some months ago, they now are moving to fund a substantial volume of existing bank credit through new bonds.

This raises the question whether the scramble for bond money might unsettle the market again as it did in the early spring when corporate management in its haste to beat the Treasury to the market caused a glut of borrowers. The answer would seem to be a fairly definite "No."

It is the studied and unanimous opinion of leading economists that we are headed for better bond prices and for lower interest rates. Their views in this respect probably can best be summed up in the words of Dr. Marcus Nadler, consulting economist to the Hanover Bank, New York.

"Money rates will depend on business activity, position of the Treasury and the Reserve authorities." (The index of business activity at the 1953 year-end will be only slightly lower than the prevailing 235 level, he pointed out. We are not headed for a serious readjustment or for a serious decline in business. Treasury borrowing will be light, and not sufficient to bring Government debt to the legal limit of $275 billion from $272.4 billion at present. And the Federal Reserve Board is not likely to try competing again with private borrowers for long-term funds as it did so disastrously only a few short months ago.)

"The short-term demand for money in the next 12 months will be somewhat smaller than it was during the past 12 months.

"The supply of funds at the disposal of the banks will be large, either through increased open-market purchases by the Reserve authorities or the lowering of the Reserve requirements, and possibly both.

"The demand for capital from private sectors in the next 12 months will be smaller than in the previous 12 months, although the demand from public authorities, municipalities, etc., will be greater."

(According to the consensus, however, the increase in financing by public authorities is not expected to offset the anticipated decline in private capital needs.)

"The supply of funds seeking an outlet in long-term obligations will remain large, and will be more than adequate to meet all legitimate requirements.

"Therefore, one can reach the final conclusion, namely, we have seen the peak in money rates. And, while it is quite evident that bond prices are bound to go up and down, the trend of interest rates, short-term as well as long-term, is down, unless something unforeseen occurs."

With the prospects for lower bond yields increasing, the life insurance companies have quickly found themselves with more funds available for investment. Only a few weeks ago they expressed themselves completely committed for their incoming cash flow until mid-1954. They now are coming into the market, however, with new investment funds. The reason is not hard to find. Interest rates are dropping and the life insurance companies this year are expected to show the second successive year of increasing their resources by more than $5 billion.

Savings and loan associations' resources also seem headed for a peak. In the first six months of this year their assets increased by $2 billion; and continuance of this rate of gain would establish a new record high assets gain of about $4 billion for this year.

In addition, assets of mutual savings banks are rising at a $2 billion annual rate and time deposits of commercial

(Continued on page 29)

INDEX OF YIELDS : SELECTED UTILITIES STOCKS

	Oct. 1953	Sept. 1953	Aug. 1953	July 1953	June 1953	May 1953	Apr. 1953	Mar. 1953	Feb. 1953	Jan. 1953	Dec. 1952	Nov. 1952
Natural Gas Transmission Companies	4.44%	4.90%	4.46%	4.76%	4.72%	4.34%	4.18%	4.04%	3.95%	4.04%	4.04%	4.14%
Natural Gas Transmission & Distribution Companies	5.58	5.74	5.13	5.41	5.55	5.28	5.06	4.91	4.91	5.02	4.99	5.14
Manufactured & Mixed Gas Companies	4.94	5.14	4.99	5.06	5.08	4.80	4.73	4.63	4.65	4.87	4.83	5.00
Class "A" Electric Companies	5.14	5.41	5.27	5.41	5.53	5.18	5.14	4.97	5.05	5.08	5.10	5.20
Class "B" Electric Companies	5.37	5.61	5.50	5.41	5.68	5.35	5.06	4.93	5.08	5.19	5.08	5.19

This is a straight arithmetical index of comparative yields obtainable on a selected group of gas and electric utility industry common stocks.

The companies comprising this index have been selected by the AMERICAN GAS JOURNAL as providing a representative cross-section of each industry, from the standpoint of geographical diversification and of the relative importance of the individual companies in their areas.

No effort has been made to weight the average to give effect to changes in capitalization or in dividend rates because the yields afforded on the issues reflect such changes. The index is designed to show the rate of return and not necessarily market movements on the stocks comprising it.

This index is compiled from: natural gas transmission companies, 5; natural gas transmission and distribution companies, 5; manufactured and mixed gas companies, 4; class "A" electric companies, 4; class "B" electric companies, 5.

Gas Utilities Advised on Service Area Extensions

by Leo T. Parker
Attorney at Law
Cincinnati, Ohio

A NUMBER of diverse factors are involved when the courts are called upon to decide whether or not a gas company has the legal right to refuse extending its service mains into areas with potential new customers.

This problem was typified by the request for, "a dependable legal rule which tells when a gas company is obliged to extend its mains to serve new consumers in new subdivisions."

It is true that a phase of law, important to gas officials, relates to the right of refusing to supply service to new property owners. Hence, with so many new real estate developments, the important question is: when is a municipal gas company legally compelled to extend its gas service?

Obviously, if all gas companies were compelled to supply gas to all who demand service, an impossible situation would exist. Frequently, it has been held that it is the duty of gas company officials to determine when public necessity requires extension of gas mains. Whether or not a gas company can be compelled to extend its service to new industrial firms and consumers depends upon: the real necessity; the expense involved; and the financial responsibility from the standpoint of governmental requirements.

Under ordinary circumstances a gas company is not under legal duty to establish an extensive system of gas distribution to new consumers, particularly those located in isolated localities, and especially where a franchise or other contract does not distinctly specify that such extensions shall be made.

For example, in the case of Greenwood v. Provind, 108 So. 284, it was disclosed that an owner of property in a new subdivision instituted legal proceedings to compel a municipality to extend its gas lines 700 feet to the new subdivision. In holding the company not required to make the extension, the court explained as follows:

"We think the question of the extension, from one part of the city where the mains are laid to another part of the municipality which comprises new territory taken into the corporation limits, is within the discretion of the municipal authorities, and unless an abuse in the exercise of their judgment in that regard is manifest, then their decision of the question is final. Certainly it is the law that a resident of a municipality, living in a remote corner thereof, may not compel city authorities to extend gas mains to his premises, regardless of the cost, merely because the citizen resides within the boundaries of the municipality. The extension of the system from one part of the city to another part depends upon the reasonableness of such extension, considering the demand for it, the number of subscribers, and the revenue to be obtained."

Good judgment is a factor

Therefore, according to this court decision, it would seem that under ordinary circumstances and conditions a gas company's officials may, in the exercise of reasonably good judgment, refuse to extend service if the prospect for future demand and revenue is not, in their judgment, reasonably good and satisfactory.

On the other hand, the higher courts hold that if the franchise may be construed unmistakably to require the company to supply gas to all inhabitants in a specified area, the company is bound to extend its mains for the purpose of adequately supplying gas to all of the citizens who live in, or conduct enterprises in, this locality.

In the case of Massena v. St. Lawrence, 214 N.Y.S. 113, the board of trustees of a village adopted an ordinance granting a franchise to a company to construct, lay and maintain mains and pipes in the public streets and highways of the village, and to operate therein a distributing system.

In subsequent litigation, in view of these franchise provisions, the higher court held the company bound to extend its mains and systems through the various streets, saying:

"The franchise granted by the village and accepted by the defendant (company) is a contract, and is enforceable by either. . . . In my judgment it should be held that these parties contracted, not only with reference to the streets then in existence, but with respect to all highways that might be thereafter accepted by the village. . . ."

So, therefore, a franchise or other contract may be implied by the courts to compel a gas company to extend its gas service to all new consumers.

The law presumes every person, firm and corporation to be honest and trustworthy until proved to the contrary. Frequently, the character of dealings is such that one party to an implied contract is compelled to rely upon the honesty of the other. Under these circumstances the courts imply a warranty on the part of the former that he will perform the assumed or actual obligations, as well as those obligations which should by right be fulfilled.

An implied contract never is agreed upon by the parties to a contract. It is not a contractual obligation, but a common law right invocable by one of the parties under various circumstances consistent with the present legal policy of "right is might." In other words, the courts may assume the existence of an implied contract on the part of a gas company to extend its mains.

Generally speaking, however, the law is established that unless by franchise, or contract, a gas company is obligated to extend its mains and service, it will not be compelled by a court to do so, unless the testimony proves that the derived income will be 5% annually, or more.

If increased future income is practically assured, a gas company may be ordered by the court to extend its service on a present annual net income of 2% to 3%. See New York v. Railway Gas Company, 245 U. S. 345. Here the Supreme Court of the United States ordered a gas company to extend its service nearly 2 miles to a rapidly growing subdivision of 350 homes although the present annual income would be only 2¼% on the investment. This was done because the evidence convinced the court that the population of the community soon would increase to afford a "fair" return on the company's investment. The court said:

"Corporations which devote their property to a public use may not pick and choose, serving only the portions of the territory covered by their franchises which are presently profitable for them to serve."

Avoid injury liability

A gas company official recently said: "Suits filed against gas companies by injured persons are getting to be serious. It seems that lately both the lower courts and higher courts award unusually high damage allowances. What can officials do to reduce these high damage allowances?"

(Continued on page 38)

FEDERAL POWER COMMISSION

Panhandle Eastern Declared Guilty of Natural Gas Act Violation

A Commission presiding examiner has concluded that Panhandle Eastern Pipe Line Company and Southeastern Michigan Gas Company have been violating provisions of the Natural Gas Act under an arrangement whereby Panhandle is supplying natural gas to Mueller Brass Company with deliveries being made by Southeastern Michigan under a transportation agreement with Panhandle.

The decision also concludes that Panhandle's maintenance of priority of service for some of its direct sale industrial customers, different from those set forth in its filed tariff and rate schedules, is unduly discriminatory and unlawful.

In ruling on the service to Mueller, the examiner pointed out that even though there is a continuous and uninterrupted flow of natural gas in interstate commerce from Panhandle's interstate pipeline system to the Mueller plant, neither Panhandle nor Southeastern have obtained appropriate authority from FPC. He also declared that Southeastern has not filed a tariff, rate schedules and service agreement covering its transportation service for Panhandle. The decision states that the gas service to Mueller commenced in November of 1951, and that during the 12-month period ending September 30, 1952, a total of 107,625,000 cubic feet was transportated and delivered.

The second part of the examiner's ruling relates to contracts to direct sale industrial customers which contain a so-called "superior" interruptible provision. The ruling held that this provision gave direct sale customers a preference by permitting them to be the last of all interruptible customers to be curtailed when it is necessary for Panhandle to interrupt or curtail all interruptible customers in favor of its firm resale customers. The examiner concluded that the contracts, which contain this so-called "superior" interruptible service provision, unduly discriminate against Panhandle's resale customers who buy gas under the "I" (interruptible) schedules, and create an undue preference for all direct sale customers who have them. He further stated that these contract provisions are in violation of the Natural Gas Act, and that Panhandle's practice of making contracts for the so-called "superior" interruptible service is unlawful.

TETCO Gets Okay for Temporary Added Deliveries

The Commission has granted temporary authorization to Texas Eastern Transmission Corp. to increase natural gas deliveries to several existing customers under its short-term firm service and winter-peaking service rate schedules.

Texas Eastern will deliver additional gas to Equitable Gas Co., National Gas & Oil Corp., Manufacturers Light and Heat Co., The Ohio Fuel Gas Co., Philadelphia Electric Co., and Public Service Electric & Gas Co., City Gas Company of New Jersey and Philadelphia Gas Works.

Certificates to Columbia Subsidiaries for New Facilities

The Commission has issued certificates affecting seven Columbia Gas System subsidiaries authorizing the construction of facilities, having a total estimated cost of near $6½ million, which will make additional natural gas available to meet anticipated requirements during the winter.

The certificates were issued to Central Kentucky Natural Gas Co.; jointly to The Manufacturers Light and Heat Co., Natural Gas Company of West Virginia, Cumberland and Allegheny Gas Co., and Home Gas Co.; and jointly to Atlantic Seaboard Corp. and Virginia Gas Transmission Corp.

In a concurrent order the Commission granted a motion filed in a related proceeding by these seven and two other Columbia subsidiaries—United Fuel Gas Co. and The Ohio Fuel Gas Co.—to stay the limitations previously imposed on maximum daily volumes of natural gas to be transported through their systems. The limitations are stayed pending the completion of hearings on the allocation of gas by the various Columbia companies.

The FPC said that the estimated gas supply to the Columbia system will be adequate to meet anticipated full peak day requirements during the 1953-54 winter season, and that there appears to be no present necessity for continuing the limitations.

Hope Natural Rate Increase Settled

The Commission has accepted a proposed settlement under which Hope Natural Gas Co. will increase its wholesale natural gas rates by about $3,511,308 per year, instead of by $5,130,081 annually as originally proposed by the company in rate changes which were suspended by FPC.

In a concurrent order, FPC suspended a further proposed increase by Hope, which would amount to approximately $3,676,000 per year over those rates which Hope will collect under the approved settlement.

The settlement terminates proceedings on two proposed increases by Hope. One, totaling about $1,897,445 annually based on the year 1952, was suspended in September, 1952, and has been in effect under bond since last February 15. Under terms of the settlement, Hope will be allowed to retain the amounts which it has collected under bond. The other increase was suspended until Oct. 2, 1953.

The rates contained in the settlement will be effective as of Nov. 6, but Hope will be required to adjust its bills or make refunds to its customers so that its charges will be the same as if the approved rates had been in effect since October 1.

The increased rates affect Hope's six interstate customers: The East Ohio Gas Co., The Peoples Natural Gas Co., New York State Natural Gas Corp., The River Gas Co., The Manufacturers Light and Heat Co., and The Mount Morris Gas Co.

(Continued on page 41)

American Gas Fundamentals OUTLINE

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- *Geology
- *Drilling and completion
- *Methods of estimating reserves
- *Chemicals from gas
- *Natural gas conservation
- *Underground storage of natural gas

MANUFACTURED GASES
- *Coke oven gas; producer gas, blue gas; carbureted water gas
- *Reformed gas
- *Hi-Btu oil gas
- Interchangeability

LIQUEFIED PETROLEUM GASES
- *Sources, properties and uses

BASIC GAS LAWS
- *Perfect gases
- Supercompressibility

TRANSMISSION
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- *Public relations
- Theories of rate making
- Rights-of-way

GLOSSARY
- *Ab-to-Inj

***Indicates chapters published since January 1, 1951; available without charge to new subscribers to American Gas Journal.**

How to Use the Material

American Gas Fundamentals *is a comprehensive compilation of basic gas facts to guide any gas utility employee toward a broader understanding of the industry as a whole.*

The series is designed to be removed from each current issue of AMERICAN GAS JOURNAL *and filed in a ring binder where it may be accumulated into a text book of permanent usefulness. Material should be filed under the major subject head appearing in the upper right hand box at the head of each chapter.*

Glossary of Gas Industry Terms: Inj to Met

I—CONTINUED

INJECTOR TUBE A tube with a venturi throat which leads from the primary air port and gas orifice of a gas burner to mixing chamber and burner ports. As the gas passes from the gas orifice through the tube, it draws air through the primary air port into the mixing chamber, after which the mixture is burned at the burner ports.

INPUT POWER The amount of power or energy being used or entering a machine.

INPUT RATING The maximum rate at which fuel can be fed to a burner.

INPUT WELL A well used to inject gas into a producing sand for storage or for oil reservoir pressure maintenance.

INORGANIC THEORY A somewhat discredited theory that holds that oil and gas are a product of the reaction of heavy metal carbides with subterranean water, rather than the decomposition of organic, animal or vegetable matter.

INSPIRATOR Another term for injector tube.

INSPIRATOR MIXER A mechanical device in which primary air is drawn by a jet of gas into a mixing chamber at a rate proportional to the gas flow rate.

INSTITUTE OF GAS TECHNOLOGY A Chicago educational institution, supported by the gas utilities and gas appliance manufacturers, dedicated to basic and applied research in the gas industry and graduate training in gas technology.

INSULATED FLANGE A set of flanges inserted in a pipeline, with the faces insulated from each other, for the purpose of stopping flow of electric current through the pipe.

INSULATING MATERIAL Any material of low thermal conductivity used to reduce the flow of heat.

INSULATION Protection against the flow of heat or the flow of electricity.

INTEGRATED COMPANY In the oil industry, a large company operating in all branches of the industry.

INTER-COOLER A heat exchanger used to cool a substance between the stages of an operation, performed on the substance.

INTERMEDIATE PRESSURE In gas distribution operations, pressures ranging from about 0.5 pounds per square inch to about 5 pounds per square inch.

INTERMITTENT PROCESS A non-continuous manufacturing process in which each operation is done separately with intermediate handling between steps.

INTERMITTENT RETORT A coal gas generating retort which operates on one batch of coal at a time with removal of gas and coke before charging the retort with the next coal batch.

INTERNAL PRODUCER One built into the setting of a bench of coal gas generating retorts.

INVERSION TEMPERATURE For any gas, the temperature at which throttled expansion produces neither heating nor cooling of the gas.

ION An atom or group of atoms carrying an electric charge as a result of gain or loss of one or more electrons from the atoms.

IRON CASE METER A gas meter in which the external case is of cast iron.

IRON OXIDE A chemical combination of iron and oxygen, such as ordinary rust on iron.

ISOBUTANE A hydrocarbon of the same chemical formula as butane (C_4H_{10}), but slightly different molecular structure, resulting in different physical properties, notably higher volatility.

ISOTHERMAL Occurring at constant temperature.

ISOTHERMAL COMPRESSION Raising the pressure of a gas without changing its temperature.

J

JACK HAMMER A tool, usually powered by compressed air, used to break stone, concrete and asphalt.

JACKET The space surrounding a cylinder of an engine through which a cooling liquid flows. Steam engine cylinders are sometimes heated by steam circulating through a jacket to prevent condensation on the inside cylinder walls.

JARS A device used in cable drilling, shaped like two elongated links and attached to the drilling tool so that it will strike the bottom of the well with intensified force.

JET CONDENSER A condenser in which a jet of cooling water comes in direct contact with the vapor to be condensed. The water is forced through a jet into a pipe of venturi shape, creating a partial vacuum, which together with condensation of vapor, draws a flow of vapor into the condenser.

JOINT A single length of pipe or tubing. A connection between two lengths of pipe.

JOURNAL The portion of a shaft which rests and moves in a bearing.

JOURNAL BEARING A bearing which supports a journal.

K

KELVIN SCALE A temperature scale based on the average kinetic energy per molecule of a perfect gas and having zero on the scale at 273.8 degrees below zero, Centigrade.

KEMSOLENE A petroleum naphtha used as a solvent and having a boiling point of 290-300°F.

KEROSENE An oily liquid obtained in the distillation of petroleum, distilling off after gasoline in a temperature range from 174-288°C. A hydrocarbon of specific gravity 0.747 to 0.775. Used as fuel for some internal combustion engines, heating equipment and illuminating purposes. A heavy grade, known as range oil, is used for cooking and heating.

KEY ROCK A rock stratum that can be identified over large areas and from which measurements can be taken to determine geologic structure.

KILN An oven or furnace used for such purposes as seasoning lumber, treating ores before smelting and firing ceramics and glass.

KILOGRAM-CALORIE (KC) The amount of heat necessary to increase the temperature of a kilogram of water one degree Centigrade.

KILOMETER 1,000 meters; 1,093.68 yards.

KILOWATT A unit of electrical energy equivalent to 1,000 watts, or approximately 1 1/3 horsepower.

KINEMATIC VISCOSITY A measure of the resistance of a fluid to flow, including the effect of fluid density. It is equal to the absolute viscosity divided by the density.

KINETIC ENERGY The energy possessed by a body due to its own motion.

KOSMOBILE Dustless gas carbon black granules used in rubber formation.

KOSMOS Compressed carbon black made from gas and used in rubber formulations.

L

LAGGING Asbestos and magnesia plaster used on process equipment and piping as a thermal insulation.

LAG SCREW A heavy screw with a square bolt head.

LAMP BLACK A powdery form of carbon produced from the burning of gas, or other carbon-containing fuel, with an insufficient air supply and cooling the gases from the flame below the combustion temperature of carbon, so that a sooty deposit of lamp black is formed.

LAMP WAX Paraffin wax.

LAP WELD Overlapping of edges of pieces to be joined, with the weld made between the edge of one piece and the body of the other piece.

LARGE PORT BURNER A burner having a single large discharge opening.

LARRY A traveling crane on rails and provided with a hopper for carrying solid materials.

LATENT HEAT Change in heat content of a substance when its physical state is changed.

LATENT HEAT OF VAPORIZATION The quantity of heat required to change a unit weight of a liquid to vapor with no change in temperature.

LATERAL A pipe, in a gas distribution or transmission system, which branches away from the central and primary part of the system.

LAY IN Place a pipeline in its ditch.

LAYING CAT A Caterpillar tractor having a side boom used to lay pipe.

LAYOUT A drawing or chart showing the relationship of various pieces of equipment to each other in a plant.

LAY UP The construction method in which bricks, blocks, tiles or similar materials are set in a suitable mortar to form the desired structure.

LAYING MAINS The whole operation of installing piping systems in towns or cities including trenching, joining sections of pipe, laying pipe in trenches, back-filling trenches and cleaning up.

LEAD JOINT A method of joining sections of cast iron bell-and-spigot pipe in which the bottom of the joint is packed with oakum, followed by lead wool or molten lead which is hammered into place to provide a gas-tight seal.

LEAK CLAMP A clamp used to press a gasket against a leaking section of pipe or pipe joint to seal the leak.

LEAK DETECTOR A chemical or electrical device which detects and locates gas leaks in piping or equipment.

LEAN GAS The gas with comparatively low heating value produced at the end of the carburizing period of a coke oven or coal gas retort plant. Also, the remaining natural gas after gas containing liquids has gone through an absorber.

LEAN MIXTURE A mixture of air and fuel in which air is supplied in excess of combustion requirements.

LEAN OIL Absorption oil returned to the absorber of a natural gasoline plant after the natural gasoline has been distilled from the oil.

LEASE A contract for possession and profit of property for a set period in consideration of payment of rent; the document by which such rights are conveyed. Also, an area of land leased for development of minerals; the property occupied by any given minerals producer.

LEASE HOUND A dealer in oil and gas leases; a person who obtains leases for an independent oil operator or an oil company.

LEATHER OIL A mixture of mineral oil, neatsfoot oil, olive, lard or fish oil, used for leather treatment to loosen and soften fibers and impart good wearing qualities; used to treat leather diaphragms in gas meters.

LEDUC'S RULE The volume of a gas mixture is equal to the sum of the volumes that would be occupied by each of the components of the mixture if at the temperature and pressure of the mixture.

LEHR An oven used for the controlled heating and cooling of glass-and-ceramic-wave.

LENSES Oil pools formed by variation in sedimentation in the original formation of sedimentary beds and not identified with definite geologic strata.

LIFT One of the movable sections of a liquid-sealed gas holder; the vertical distance a liquid is pumped.

LIFTING FLAME (See Floating flame.)

LIGHT FRACTIONS Low specific gravity oils from controlled distillation of crude oil; also substances such as benzene and toluene obtained in manufacture of coal gas.

LIGHT FUEL OIL Distillate fuel oil of grades 1 and 2.

LIGHT OFF Generally meaning to ignite or to burn away; in water gas manufacture, to burn the combustible portion of the blast gas formed in the preparation period of the gas-making cycle.

LIGHT OILS (See Light fractions.)

LIMING LEG That part of an ammonia still in which a solution of fixed ammonia compounds are mixed with lime before further processing.

LINEAR VELOCITY Distance moved in a straight line, per unit of time; such as, feet per second and miles per hour.

LINE FITTINGS Fittings used in piping to change the direction of the pipe line or divide the flow between two or more pipes; include elbows, tees, crosses and y's.

LINE GOVERNOR (See Governor.)

LINE PIPE Seamless steel pipe used in such pipeline transportation as petroleum and gas.

LINERIDER An employee who inspects a pipeline for leaks. At one time he walked or rode horseback; today, he uses an automobile or a light aircraft.

LIQUID A physical state of a substance in which it will continuously deform when subjected to a shearing stress.

LIQUID GOLD A popular name for petroleum oil.

LIQUID PURIFICATION The removal of undesirable constituents from a gas by passing the gas through a liquid which will dissolve or remove the impurity.

LIQUID STATE Physical condition of a substance in which it has a definite volume and conforms in shape to the containing vessel.

LPGA Abbreviation of Liquified Petroleum Gas Association.

LIQUIFIED PETROLEUM GASES LP gases or LPG; petroleum hydrocarbons of the paraffin series, normally gaseous, such as propane, butane, and iso-butane, but which can be compressed to liquid form. Sold in tanks for gas service to customers not served by gas utilities, and in bulk to utilities for peak-shaving and standby gas.

LIVE OIL An oil containing entrapped gas.

LIVE STEAM Steam having useful energy available by reason of its temperature and pressure as distinguished from exhaust steam which has had most of its available energy utilized.

LOAD The rate of gas utilization per unit of time for a given system or point in a system. To load a governor means to set the governor to maintain a given pressure at that point as the rate of gas flow through the governor varies.

LOAD CENTER The geographic center for all gas loads of a specified system or area.

LOAD CURVE A graph in which the load of a gas system or segment of a system is plotted against intervals of time.

LOAD DENSITY The concentration of gas load for a given area expressed as gas volume per unit of time and per unit of area.

LOAD DISPATCHING The operation of a gas system to supply gas in quality and in quantity sufficient to meet the demand.

LOAD FACTOR The ratio of the average volume of gas transported by a gas system, or segment of that system, during a specified time interval to the maximum volume transported during a comparable time interval. Load factors may be hourly, daily, weekly, monthly or annual.

LOADED GOVERNOR A governor so adjusted that an increase in the load produces an increase in the delivery to compensate for increased system pressure drop and maintain gas pressure throughout the system.

LOCK IN To unseal a gas meter and start gas service by opening the meter cock.

LOCK OUT To seal and lock a gas meter and shut off the cock so that gas cannot be used.

LOCK WING COCK A valve between the gas service line and the gas meter, so arranged that it can be locked in a closed position.

LOG A diary of a well that is being drilled, giving details of depth, characteristics, thickness and contents of strata drilled through.

LONG FLAME BURNER A burner designed to give a mixture of fuel and air so that the fuel burns slowly and produces a long, luminous flame.

LONG RESIDUUM Distillation residue of crude petroleum containing all the lubricating stocks of the crude oil.

LONG TON Weight measure equal to 2,240 pounds.

LOOK BOX A metal box having glass faces set into a liquid line so that flow through the line may be observed visually.

LOOSE BLACK Carbon black of low density.

LOWER HEATING VALUE The gross heating value less the latent heat of vaporization of any water vapor formed during the combustion; the net heating value.

LOW PRESSURE (See Pressure.)

LOW PRESSURE GAS DISTRIBUTION SYSTEM A gas distribution system, or the mains of a segment of a distribution system, operated at low pressures of less than 15″WC.

LOW VOLATILE COAL Bituminous coal containing a proportionately small percentage of volatile materials.

LP GAS-AIR MIXTURES Mixtures of liquified petroleum gas and air to obtain a desired Btu value and capable of being distributed through a distribution system; used for standby and peak-shaving by gas utilities.

LUBRICATED PLUG COCK A valve in which a pierced plug rotates in a tapered cylindrical body to open and close flow through the valve and which is lubricated by a screw in the top of the plug, forcing grease through the body of the plug and into channels between the plug and the valve body.

LUBRICATING GREASE A compound of a soap and mineral or petroleum oil used to lubricate slow-moving machinery or other equipment that will not retain flowing oils.

LUBRICATING OILS Heavy distillates from the fractional distillation of petroleum, following kerosene in the distillation, distilling between 253-317°F.

LUMINOUS FLAME BURNER A burner in which air for combustion is wholly supplied from the surrounding atmosphere of the flame and which gives off light due to unburned carbon particles being heated to incandescence.

M

MAGNESIA CEMENT Magnesium oxide (MgO) which is mixed with water and used as an insulating covering for hot pipes, vessels and furnaces. It is sometimes mixed with an approximately 15% asbestos fiber as a filler.

MAGNESITE A naturally-occurring mineral magnesium carbonate ($MgCO_3$) which is ground, formed into bricks or other shapes and fired to magnesium oxide. The bricks and shapes are used as refractory furnace linings. Also, magnesite is used as a source of magnesium metal.

MAIN (See Gas main.)

MAIN AIR (See Combustion air.)

GLOSSARY

MAIN EXTENSION Gas mains added to an existing distribution system to serve new customers.

MAIN SYSTEM The network of distribution piping to which customer service lines are attached. Generally, large pipes are laid in principal streets with smaller laterals extending along side streets and connected at their ends to form a grod; sometimes laterals are brought to dead ends.

MAKE The quantity of product obtained from a well or process in a unit of time.

MAKE OIL Oil converted into salable gas in the oil gas process, as distinguished from oil used to heat the generators.

MAKE PER RUN The quantity of salable gas produced per operating cycle of a water gas set.

MAKE-UP WATER Water added to a tank, boiler or other vessel to maintain a pre-determined liquid level.

MANHOLE An opening into a tank, boiler, furnace or other equipment through which a man can enter the equipment; can be sealed with a removable plate or door.

MANIFOLD A pipe to which three or more outlet pipes are connected.

MANOMETER A tube in the shape of a U, partially filled with liquid of suitable density. When points of different pressure are connected to respective ends of the manometer, the liquid is pushed up in the low pressure side of the manometer and the difference in liquid level between the two sides of the U is an indication of pressure difference.

MANUFACTURED GAS A combustible gas mixture produced synthetically in a gas plant and used as a fuel; also called city gas.

MASS The quantity of matter composing a body; also the resistance or inertia of a body to motion or change in motion.

MATTER Anything occupying space and having mass or weight.

MAXIMUM DEMAND (See Demand.)

MCF A gas volume measure of 1,000 cubic feet.

MEAN The average, determined by dividing the sum of several items by the number of items.

MEAN STACK TEMPERATURE The average temperature of flue gases in a chimney or stack.

MECHANICAL CHARGER A motor- or engine-driven device for feeding solids into reaction equipment, such as loading coal into a coke oven.

MECHANICAL DRAFT A flow of gas or air, through a duct or chambers, produced by mechanical means, such as a blower or fan.

MECHANICAL EFFICIENCY Compressor: ratio of work done on the compressed gas to the work produced to drive the compressor. Engine: ratio of brake horsepower to indicated horsepower of an engine.

MECHANICAL GRATE A motor-driven grate, in constant motion to shake ash from a fuel bed into the ash pit and to break up clinkers in the fuel bed and maintain an even fuel bed, in such equipment as a water gas generator.

MECHANICAL JOINT A method of joining two pieces of pipe by means of bolts, with a gasket squeezed in the joint to seal against leakage into or out of the pipe.

MECHANICAL PRESSURE ATOMIZING BURNER A burner in which oil is fed through a small orifice under sufficient pressure to cause the oil to break up into fine droplets or mist.

MELTING POINT The specific temperature at which a substance undergoes a change of state from solid to liquid.

MERCAPTAN An organic chemical compound having a distinctive odor in very small concentrations in air; one part in a million parts of air. Used to odorize natural and LP gases, which are virtually odorless, for detection of leaks.

MERCURY The only element existing normally in liquid form. Its common name is quicksilver due to its silver color and quick manner of rolling about on a hard surface without wetting the surface.

MERCURY SEAL A liquid seal using mercury as the liquid and used as a house regulator safety device to prevent passage of high-pressure gas into the low-pressure system.

METER BAR A metal bar for mounting a gas meter, having fittings at the ends of the bar for connecting the inlet and outlet connections of the meter and to which, in turn, the gas inlet and house piping are connected.

METER BOOKS Books in which successive readings of utility customers' meters are recorded by gas utility meter readers. The difference between successive readings is the gas consumption for the period.

METER DENSITY The number of meters per unit of area or per unit length of distribution main.

METER INDEX DIALS The measuring dials on the index face of a meter.

METER PROVER A device for testing the accuracy of a gas meter. A quantity of air is collected over water in a calibrated cylindrical bell and then passed through the meter by allowing the bell to sink into the water. A comparison of the measured amount of air passing through the meter and the amount registered on the meter dial gives a measure of meter accuracy.

METER SEAL A metal wire or tape seal attached to a gas meter or a service cock in such a way as to prevent its being opened by an unauthorized person, without detection.

METHANE The first in the paraffin series of hydrocarbons (CH_4). It is colorless, odorless and inflammable and forms the major portion of marsh gas and natural gas.

METRIC SYSTEM A decimal system of weights and measures based on international standard units of meter and gram.

The Glossary of Gas Industry Terms, of which this is the fourth installment, is being compiled by Robert M. Poe.

Skies Bright for Bond Financing

(Continued from page 22)

banks are increasing at an identical pace.

The sum of all these swelling assets for the financial institutions, which constitute the core of institutional buyers of bonds, mirrors the sharp rise which continues to take place in personal savings, which now are building up at a 7% annual rate, or nearly double the 4% pace recorded prior to World War II.

New construction this year currently is placed at $34,660 million against $32,638 million in 1952; but barring currently unforeseen developments in the international situation, a decline of 10% to 12% from present levels is looked for in construction activity in 1954. Indications are that private housing next year will encompass about 800,000 homes, compared with the current level of about 1,000,000.

Treasury short-term borrowing costs recently have been at a 34-month low, for the lowest rate since December 1950. Treasury officials cite two reasons for this—smaller than anticipated seasonal demand for funds by business and the action being taken by the Federal Reserve Board to ease its tight money policies by pumping credit into the economy. Since the easier money policy was established last May 1, the Reserve banks have increased their holdings of Government securities by more than $1,500 million.

Corporate demand for capital to date this year has been running about 29% above the 1952 total, this despite the fact that retained earnings available for capital purposes have been running at an $11 billion yearly rate.

Corporate working capital, furthermore, has been lifted to slightly more than $88 billion, a gain of 2% above the figure recorded earlier this year. Most of the improvement is due to a decline in current debts, a development which probably has resulted in some part from funding of short-term bank loans.

Underlying the improvement in corporate finances has been a favorable trend of profits. In its most recent report, the Council of Economic Advisers estimated corporate profits to be in the neighborhood of $46 billion annually. This compares with the $44.6 billion previously estimated, and with the best prior year actual record of $43.7 billion registered in 1951.

Not only are profits higher but they are of better quality. Only a very small proportion now represent inventory profits, which have been estimated recently, at less than $1 billion a year, compared with the $5 billion garnered from this source in 1951.

The higher profits also are after sharply increased depreciation reserves, which currently are being accrued on the order of $12 billion annually, or one-third more than the $9 billion set aside for increasing depreciation reserves, about two years ago.

Close observers of the Washington scene place the Federal budget deficits at more than $5 billion in the 1954 and 1955 fiscal years, even if business holds at, or close to, its present level. On a strictly cash basis, however, the deficit is expected to be only about $2 billion for each of the next two fiscal years. This would hold to a modest amount the Treasury's needs for new borrowing in the next two years.

Federal Government revenues are running at approximately $69 billion annually, giving effect to the tax cuts to take effect on January 1, 1954. A 50% corporate tax rate and a compromise on excise taxes would bring Federal revenues to between $63 and $64 billion in the 1955 fiscal year, with business holding to its present level.

The estimated deficits of $5 billion actual, and $2 billion on a cash basis, for the next two years will be larger in the event spending is needed to counteract a decline in business.

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Technique and Application of New Capacity Credit Method

(Continued from page 17)

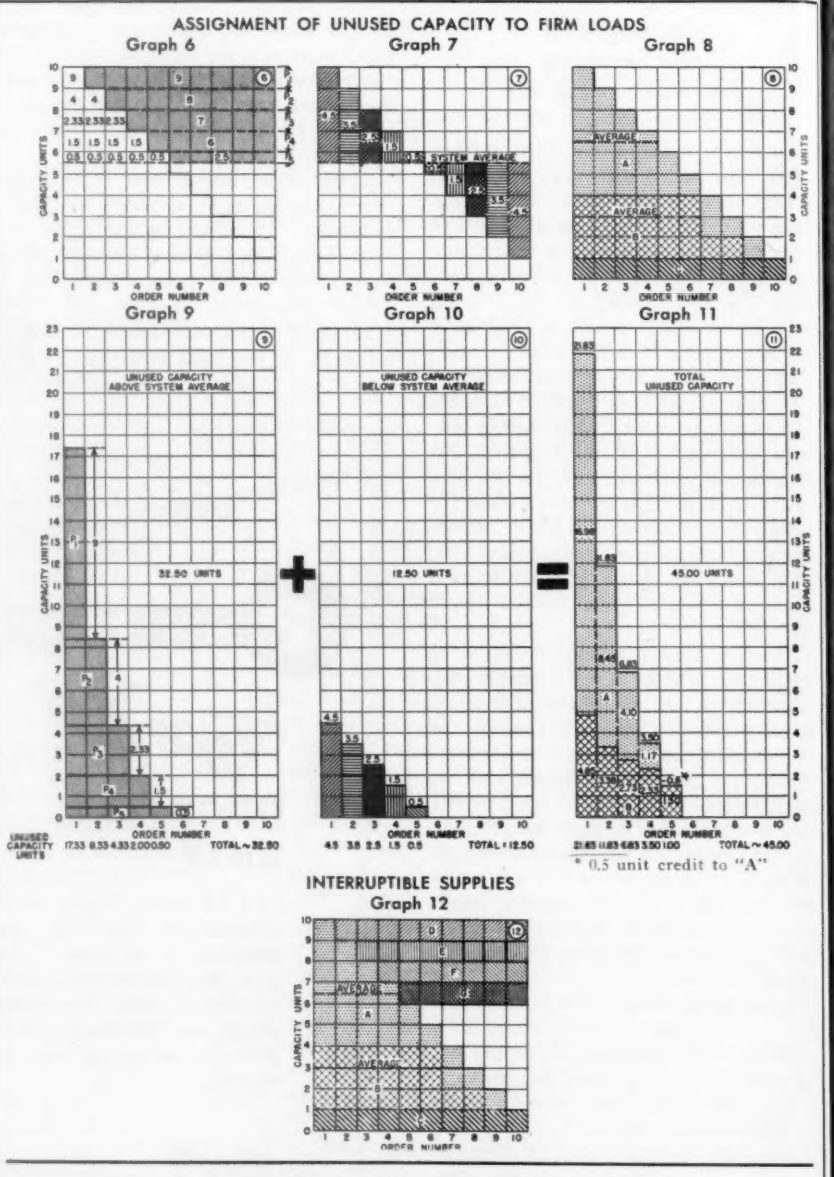
pacity are entered in column 2 of the accompanying table. Load D is curtailed during one time-unit. The average load being 0.9, the capacity credit is 0.9 units and the net capacity charge 8.1 units. Load E is curtailed during 2 time-units. Since the average load is 0.8, the capacity credit is 1.6 units and the net capacity charge is 6.4 units; and similarly for loads F and G. These capacity credits and net charges are entered in columns 3 and 6, respectively.

The total capacity charges to the interruptible loads thus determined, and amounting to 23 units, are transferred as credit to firm loads A and B which have been originally charged with unused capacity now being used by these interruptible loads. This transfer is shown in column 6 of the accompanying table. Loads A and B share the credit in proportion to the unused capacity, column 3. The net capacity charges resulting for the seven loads analyzed are entered in column 7 and the average capacity charges per unit of used capacity (or commodity), in column 8.

The 100% load factor customer, C, is charged, used capacity cost *only*. The average charge to A and B has been substantially reduced, as against the initial capacity responsibilities without interruptible sales, and the average capacity cost charged to the interruptible loads decreases as the curtailment increases. The method complies, therefore, with the basic principles of capacity cost behavior.

So far, it has been assumed that the full capacity of the system is required for firm customers. In order to illustrate the case, where the capacity of the system exceeds the firm requirements, it may be assumed now that only A and B are firm loads, the maximum requirements of which total 9 capacity-units. C is assumed to be a potentially-interruptible load, which does not need to be curtailed, however, due to the fact that capacity equivalent to its requirements is continuously available, over and above firm demand.

Assignment of unused capacity to A and B, and allocation of the credit from the curtailed interruptible loads D, E, F and G which are using such unused capacity, proceeds as before. The uncurtailed interruptible load C does not receive any credit and is now assigned 10 used capacity-units, exactly the capacity used by it. Capacity charged to this load equals that which was assigned to it, when it was treated as a firm 100% load factor customer. As can be seen,



* 0.5 unit credit to "A"

CAPACITY RESPONSIBILITIES AND CAPACITY CHARGES ESTABLISHED BY THE CAPACITY CREDIT METHOD

LOAD	USED CAPACITY	UNUSED CAPACITY	CAPACITY RESPONSIBILITY * TOTAL	CAPACITY RESPONSIBILITY * AVERAGE	INTERRUPTIBLE CAPACITY TRANSFER	CAPACITY CHARGE TOTAL	CAPACITY CHARGE AVERAGE
Col. 1	*Col. 2*	*Col. 3*	*Col. 4 = 2 + 3*	*Col. 5 = 4 ÷ 2*	*Col. 6*	*Col. 7*	*Col. 8 = 7 ÷ 2*
Firm							
A	25.00	30.20	55.20	2.21	(15.44)	39.76	1.59
B	20.00	14.80	34.80	1.74	(7.56)	27.24	1.36
C	10.00	0.00	10.00	1.00	0.00	10.00	1.00
Total	55.00	45.00	100.00	1.82	(23.00)	77.00	1.40
Interruptible		CAPACITY CREDIT					
D	9.00	(0.90)			8.10	8.10	0.90
E	8.00	(1.60)			6.40	6.40	0.80
F	7.00	(2.10)			4.90	4.90	0.70
G	6.00	(2.40)			3.60	3.60	0.60
Total	30.00	(7.00)			23.00	23.00	0.77
Grand total	85.00	——			0.00	100.00	1.18

* *Firm loads only.* ( )*denotes credits*

the method is consistent even in extreme and unusual cases.

Application of method

The Capacity Credit Method can be used for gas distribution and transmission systems with and without interruptible customers. In applying it to a gas transmission system, the daily firm supplies for all days during which deliveries exceed the firm average demand are arrayed in descending order of magnitude to form a load-duration diagram and each day is given an order number starting with 1 for the maximum day.

The partial plants are considered to be the differences in supplies between consecutive days of the load-duration diagram. The number of days in which each partial plant is used equals the order number; the number of days during which it is unused equals 365 days less the order number.

The unused capacity of a partial plant assignable to any day using such plant is computed by multiplying the partial plant with the number of days during which it is unused and dividing it by the number of days using it.

The total unused capacity above system average assignable to a particular day is the sum of the shares of unused capacity of all partial plants required during that day. It is most conveniently computed by cumulating the unused capacity shares starting with the last day of the complete peak, the day just exceeding the system average, as indicated in Graph 9. The unused capacity below system average assigned to each day (equal to the excess of supplies on that day over the system average) and the credits due to firm customers whose requirements are below average during the day, are added to the cumulative unused capacity above system average. The totals are shared on each day among all firm customer in proportion to the excess of their requirements above their average demand. The shares of each customer, summarized for all days of the complete peak and added to the used capacity, which is numerically equal to his supplies, constitute the capacity responsibility of such firm customers. The computation of capacity to be charged to interruptible customers does not require any further explanation.

Form sheets have been designed for this allocation of unused capacity which reduce the computation to a simple comptometer operation. However, for those who want to avoid manual computation, the procedure has been adapted for performance on a IBM electronic computer No. 604. This adaptation removes the objection previously raised by many rate engineers to any method which is based on more than very few peak load data. To avoid extensive computation, it was often considered expedient to use a simple approximation in preference to a logical approach and an accurate method. With advancing electronics, that is certainly no longer necessary.

In using the method for gas distribution systems, daily and hourly capacity responsibilities have to be determined. The procedure for hourly or distribution capacity is generally the same as that described in this article for daily or production capacity.

Texas A&M to Hold Instrument Forum

The Agricultural and Mechanical College of Texas will hold its ninth symposium on instrumentation for the process industries from January 27 to 29, 1954, Professor C. D. Holland, symposium director, has announced.

Held annually, the symposium is a cooperative program sponsored by the school in conjunction with southwest industrial firms and manufacturers of instrument and control equipment. Speakers are provided from these groups with new developments in instrumentation and control being displayed by manufacturers.

. . . announcing

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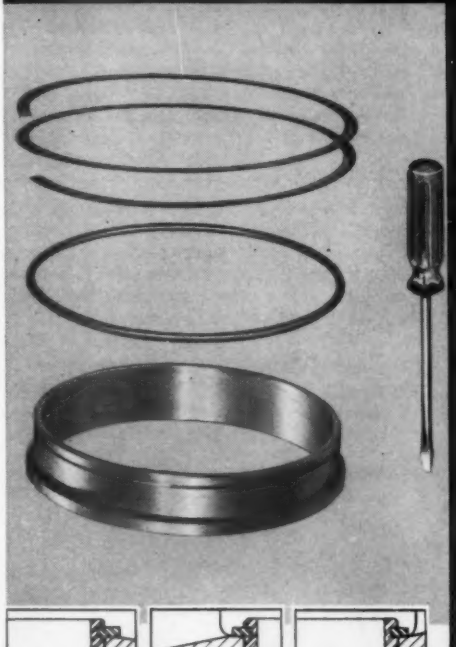

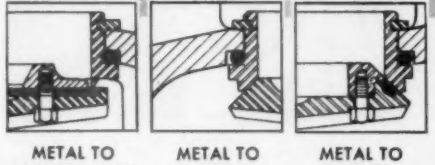

METAL TO COMPOSITION VALVE SEAT

METAL TO METAL VALVE SEAT

METAL TO RUBBER VALVE SEAT

1. To remove orifice, a screw driver is the only tool needed.
2. Orifice may be had in any metal, normally stainless steel.
3. Types—Seats for orifices:
   Flat Disc—Composition or Leather
   Metal to Metal
   Metal to Metal with "O" ring
4. "O" ring between valve body and seat assures perfect parallel seating as well as perfect height seating. Does not require close valve height adjustment.
5. Valve seats may be sized as much as three regulator sizes smaller. For example, a 12" regulator may have inserted valves the size of 10", 8", 6" regulators.

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News of the Gas Industry

NAME WINNER OF PERMAGLAS DEALER WINDOW CONTEST

Reuter's Automatic Heating Co., Milwaukee, Wis., has been chosen grand prize winner of a national window display contest among the dealers of the Permaglas-Heating division of A. O. Smith Corp. The division attracted the participation of one out of five of its dealers in the contest, which was one of the last phases of the company's "Get Set To Sell" merchandising drive. Dealers were furnished with certain basic window dressing materials, and awards were based on eye appeal and the ingenuity shown by the dealer in supplementing these basic props. Individual prizes and a two-day, all-expenses paid, tour to Kankakee and Chicago were awarded the 10 finalists and their sponsoring distributors. M. L. Lavorgna Co., Milwaukee, was the distributor entering the winning, Reuter's, window display in the contest.

SoUnion Expands in New Mexico

Southern Union Gas Co. began operation of the natural gas distribution system in Alamogordo, N. M., on November 6, after having purchased the distribution system in the city from Sacramento Corp. The transaction was approved by New Mexico Public Service Commission on October 23.

C. H. Zachry, president, Southern Union Gas Co., announced that the manager in Alamogordo will be Carl O. Reed, an employee of the company for the past seven years.

Prior to the purchase, Southern Union conducted an extensive survey of the distribution system to determine the city's present and future needs. Results of the survey will be used in planning anticipated improvements in the system.

With the addition of Alamogordo, Southern Union now serves approximately 237,000 customers in 60 towns and cities in New Mexico, Texas, Arizona and Colorado.

FPC Queries TGT Accounting Entries

Federal Power Commission has questioned certain accounting entries made by Tennessee Gas Transmission Co., and has issued an order directing the company to show why it should not be required to adjust its books to correct overstatements totaling $3,150,199 in its plant account and $1,655,882 in its earned surplus account.

NEGA Issues Membership Directory

The 3rd edition of the membership directory of New England Gas Association has been distributed by NEGA to association members. The new directory, with more pages and information than previous editions, presents indexes covering companies, individuals, communities served, products and services, and statistics covering the New England Gas Industry.

Reeves Bros Acquires Subsidiaries

Reeves Brothers, Inc., has announced the acquisition of The Vulcan Rubber Products Corp., Brooklyn, N. Y., and Duroflex Inc., Buena Vista, Va. Both companies will become separate corporate subsidiaries, while all assets, properties, machinery and trade names will come under Reeves ownership and management.

E. C. Hemes

Dale J. McKnight

Officers of the new subsidiaries are: John M. Reeves, president of Vulcan and Duroflex; E. C. Hemes, vice president and general manager of both subsidiaries; and Dale J. McKnight, sales manager for both.

Products manufactured by the company include gas meter diaphragms, industrial coated fabrics, fuel pump diaphragms and a group of new products now under development.

Coal Group Urges Gas Use Control

National Coal Association has adopted a resolution calling upon Federal Power Commission to control the end-use of natural gas and upon Congress to adopt a similar national fuel policy. NCA wants action by FPC and Congress which would result in allowing natural gas companies a fair field price for their own produced gas and independent producers a fair commodity value for gas sold to pipeline companies.

The resolution urges FPC "to refuse to issue certificates of convenience and necessity for natural gas pipelines where the natural gas to be transported by such pipelines or any substantial portion thereof, will be used as boiler fuel or will be used for other inferior purposes for which adequate supplies of bituminous coal are available."

Also, the resolution urges Congress "to adopt a national fuel policy with respect to the conservation of natural gas which would have the effect of prohibiting the use of this valuable resource for inferior purposes for which adequate supplies of bituminous coal are available."

The resolution requests members of the association "record their support of efforts of the natural gas industry to obtain a fair field price for natural gas in rate structures regulated by FPC and further record their view that legislation which will enable the producers of natural gas to obtain a fair commodity value therefor will contribute to the public interest by slowing the rapid exhaustion of this limited resource through uneconomic uses for inferior purposes."

Corrosion Control Course in Dec

A corrosion control short course will be given by the University of Oklahoma, College of Engineering and Extension Division, in cooperation with the central Oklahoma section of the National Association of Corrosion Engineers, at Norman, Okla., December 1 through 4. A four day series of technical papers and panel discussions, speakers and program for the short course have been selected with the object of making engineers and operating foremen better acquainted with the practical aspects of corrosion control.

H. J. Crawford

Harry Jennings Crawford, director, Columbia Gas and Electric Corp., Manufacturers Light and Heat Co., and Lone Star Gas Co., died November 3, at the age of 86.

Mr. Crawford, financier and industrial leader, and prominent in the oil industry in Venango County, Pa., was honored last May, as a pioneer in the gas and oil industry.

Charles U. Williams

Charles U. Williams, founder of the Williams Oil-O-Matic Heating Corp., and a pioneer in the oil heating industry, died October 30, at 86 years of age.

Mr. Williams was the organizer and first president of Williams Oil-O-Matic Heating Corp., which was incorporated in 1924. He served as president until 1939, at which time he retired.

Ohio Fuel Gas Starts Feeder Lines

A $230,000 pipeline is being built by Ohio Fuel Gas Co. to improve service in downtown and eastern Toledo.

A 20-inch main which carries gas through the business district and east side is supplied largely by two 10-inch feeder lines. To provide capacity to deliver a larger volume of gas one of the 10-inch feeder lines is being replaced by a 16-inch line.

Also, Ohio Fuel Gas Co. started construction in August on a new six-inch feeder line designed to improve service in north Springfield, O. The project is part of a program for the Springfield area on which the company plans to spend $60,000 this year, for the Springfield area.

Portland G&C Wins Report Trophy

Portland Gas & Coke Co. was judged as having the best annual report of the gas industry by the board of judges in the recent survey of 5,000 reports conducted by "Financial World." This is the second consecutive year that the company has been named the winner.

The bronze Oscar of Industry trophy will be presented to G. H. Gueffroy president of the company, at the annual awards banquet in New York, on October 26.

In this industrial classification, Consolidated Natural Gas Co. was second, while Equitable Gas Co. finished third. The panel of judges is composed of six financial writers and editors from magazines and news services.

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Day Is Reelected Supplers Mayor

Stephen D. Day was reelected to a 2-year term as Mayor of the Gild of Ancient Supplers at its annual meeting in St. Louis, October 26.

Other officers elected were: Senior Warden, George P. Velte, Magic Chef, Inc.;

Master-of-Revels Alvin M. Stock

Clerk, William G. Hamilton, Jr., American Meter Co.; Keeper-of-the-Treasure, Glenn H. Niles. The Aldermen are Joseph A. Messenger; Frank C. Packer; and C. D. Lyford, Minneapolis-Honeywell Regulator Co.

Mayor Day soon will announce his appointments of Sergeant-at-Arms, Wardens and Master-of-Revels.

The Gild held its 16th annual Wassail, following the meeting, with some 400 Supplers and Burghers, the latter being gas company executives invited for the occasion. The Wassail was directed by Master-of-Revels Alvin M. Stock.

Gas Sales Rise in September

Sales of the gas utility industry to ultimate customers during September, 1953, totaled 3,579 million therms, a gain of 1.1% over sales in the same month a year ago, American Gas Association reports. The Association's September index of total gas utility sales was 153.8% of the 1947-1949 average.

For the 12 months ended September 30, 1953, utility gas sales totaled 55,732 million therms, an increase of 9.8% over therms sold in the previous cumulative period.

Natural gas utility sales in September totaled 3,401 million therms, an increase of 1.3% over sales in September, 1952. For 12 months ended September 30, sales of natural gas amounted to 52,484 million therms, a gain of 10.7% over sales in the previous 12-month period. The index of natural gas sales for September was 161.3% of the 1947-1949 average.

Manufactured and mixed gas sales in September totaled 178 million therms, a decline of 3.0% under a year earlier. For the 12 months ended September 30, manufactured and mixed gas sales were 3,248 million therms, down 3.1% under the previous comparable period. The Association's index of manufactured and mixed gas sales in September was 81.5% of the 1947-1949 average.

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Long Island Lighting Installed Underground Propane Tanks

(Continued from page 15)

every open hydraulic valve. This may be done either by manual operation of dump valves, located at several places in the plant, or by action of fusible plugs calibrated to fail at overtemperature in case of a fire. The system utilizes hydraulic oil pressure to open the piston-actuated valve. Release of the oil pressure closes the valve by spring action. A system of dead-man levers, controlling valves in the oil system, is held in position by air-loading pressure. Opening the emergency dump valves releases this air pressure, causing the Shand and Jurs valves to close.

Hydraulic valves are installed in both cover connections in each tank and are also used as sectionalizing valves in the two liquid transport lines.

Two fire hydrant systems have been provided. In one, an 8″ city water connection supplies several hydrants in the vapor compressor and truck unloading areas and also feeds a line of spray nozzles which are positioned to spray the exposed manway covers. The supply of water to the second hydrant system is provided by three 5000 gpm pumps which normally provide 90 psi harbor water to the plant cooling water systems through two 20″ cast iron lines. This hydrant system is arranged in a complete loop around the storage area with sectionalizing valves to isolate damage or for selective operation. Supply valves at the take-offs from the 20″ cast iron lines are motor-operated with control buttons at two locations, one remotely placed at a point convenient to other active production plant operations.

The two water piping systems are separated so that damage to either line should not affect the other.

Additional fire fighting apparatus consists of small dry-powder units and larger portable wheeled units which are stored indoors.

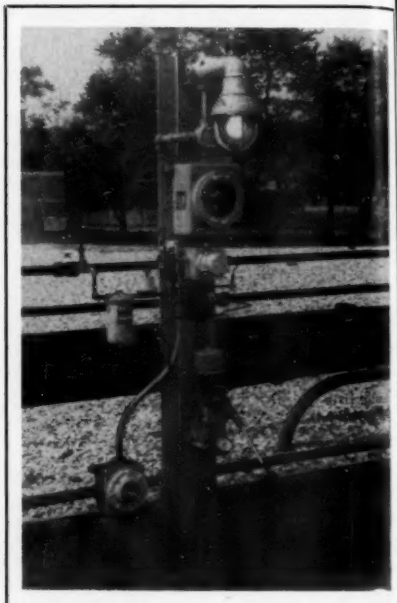
Lightning-protection system

In order to assure adequate protection for the storage area against lightning, an aerial counterpoise system was installed. It is shown in the diagram below.

Tests by Westinghouse and the General Electric Corporation showed that an elevated and grounded conductor affords protection from lightning over the area subtended by an angle of 30 degrees on each side of the vertical.

The arrangement is shown in the accompanying diagram. The connections to ground serve as supporting guy wires for the 55′ wood poles.

Materials for this system were partially influenced by the restrictions that were in effect during the installation. The horizontal cables are 3-strand #8 galvanized steel wire selected by determination of tension requirements to span the distance between poles. The guy wires are 7-strand #7 extra high strength copperweld wire, sized for required tensile strength and conductivity. These guy wires are connected to the buried system of ground wire which extends throughout the plant area.

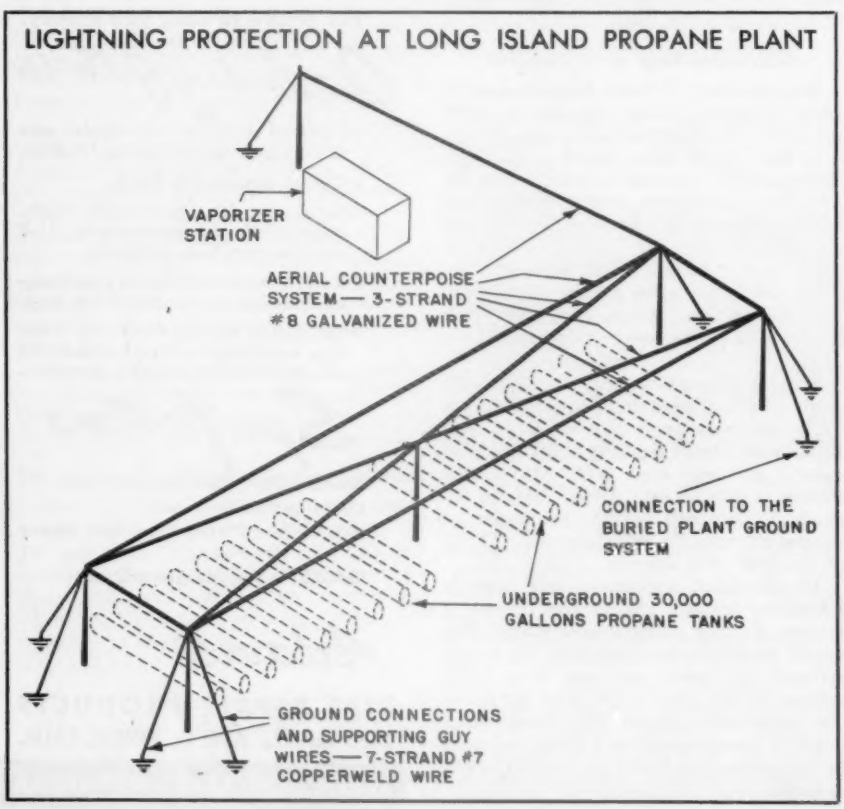


Combustible detector unit continuously sampling atmosphere at manway cover. Signal light above unit goes out if power or detector unit fails. In case of gas leakage, alarm sounds and light goes out indicating which detector unit has sounded alarm.

To provide protection against possible tank or piping leakage, a system of Davis Emergency Equipment Co. combustible detectors is installed. These detectors draw continuous samples of atmosphere and give an audible alarm and visual indication if a leak is detected.

The detector units use 20 psi dry compressed air to aspirate the sample through the instrument. Instruments are calibrated to sound the alarm at 30% of the lower explosive limit for propane. To reduce the number of detector instruments, a single detector is used for 2 sampling points. Two samples are drawn simultaneously through one detector, and controlled by the use of individual flow indicators and needle valves in the sample lines; this makes it possible to equalize the rates of flow of each sample through the instrument. If one sample contained gas while the other is uncontaminated air, the detector will notify the operators if the atmosphere contains gas at 60% of the lower explosive limit.

Sample points are arranged to protect locations where leakage might occur, such as the exposed manway covers, the liquid transfer pump installation, the sleeve carrying liquid lines under the roadway, vaporizer room, vapor compressor room, and 4 points for sub-


LIGHTNING PROTECTION AT LONG ISLAND PROPANE PLANT
VAPORIZER STATION
AERIAL COUNTERPOISE SYSTEM — 3-STRAND #8 GALVANIZED WIRE
CONNECTION TO THE BURIED PLANT GROUND SYSTEM
UNDERGROUND 30,000 GALLONS PROPANE TANKS
GROUND CONNECTIONS AND SUPPORTING GUY WIRES — 7-STRAND #7 COPPERWELD WIRE

surface check below the tanks. The sampling points below the tanks are arranged to sample the atmosphere in 2 perforated 8" tile lines which are run between the end foundations along the row of tanks. The tile lines pitch toward the harbor and also act as drains for surface water in the area.

Vaporizers

Two 7,000 gph vaporizers, equipped with automatic pressure control, supply superheated propane vapor for use as feedstock in the catalytic cracking units for the production of 537 Btu gas, also for enriching 537 Btu gas to 1,000 Btu. Heat is supplied by 185 psi saturated steam from plant boilers and pressure-reduced to 20 psi for the vaporizer. Condensed steam from the vaporizers flows through a flash tank before running to an open drain, minimizing the possibility of propane vapor collecting in a closed drain system in the event of leakage of the vaporizer steam coil.

California Companies Let Contract

Plans for construction of 73 miles of 30-inch natural gas pipeline in Riverside County to parallel the original Biggest Inch pipeline were completed recently by Southern California Gas Co. with awarding of a contract for the work to River Construction Co., Fort Worth, Tex. The new pipeline will cost approximately $5,300,000, and it is expected that it will be in operation by January 31.

Pipe Linings Inc Buys Somastic Div

Sale of the Somastic division of Bechtel Corp. to Pipe Linings, Inc., a wholly owned subsidiary of American Pipe and Construction Co., has been announced.

All operations of the Division will now be handled by Pipe Linings, Inc. The transfer includes all patent rights and licenses to the Somastic pipe coating process for the exterior treatment of steel pipe as protection against corrosion, material manufacturing and application plants currently in operation, and all personnel of the division.

J. S. Connell, general manager of the division, will remain in an advisory capacity for a period of time. Austin S. Joy, general sales manager, will move over to Pipe Linings, Inc. as sales manager of that organization.

Group Meets on ASA Code Change

Members of a special group studying possible changes in requirements of the American Standards Association code for natural gas pipelines met for the first time in Columbus, O., recently.

Heading the group was Frederick A. Hough, vice president of Southern Counties Gas Co., Los Angeles, the chairman of the joint committee of American Gas Association and American Society of Mechanical Engineers which has been assembled to revise the code covering the design, construction, operation and maintenance of gas transmission and distribution pipelines.

Home Service Award to Pitts Group

Flora G. Dowler, home economics director of the Pittsburgh Group Companies, Columbia Gas System, has been announced as a winner of American Gas Association's home service achievement award sponsored by *McCall's* magazine. The award was made for the home service department's work in the field of community service through its cooking schools, exhibits, appliance demonstrations, and schools program.

Colonel Rockwell Returns to Mfg Co

Col. Willard F. Rockwell, who resigned recently as assistant to Charles E. Wilson, Secretary of Defense, has returned to his position as chairman of the board of directors of Rockwell Manufacturing Co. Col. Rockwell had joined the Defense Department in April, 1952, at the request of President Eisenhower and Secretary Wilson.

Elect 3 to Board of Gas Tech Inst

Three industrial executives were named to the board of trustees of the Institute of Gas Technology at Illinois Institute of Technology during the Gas Institute's 12th annual meeting in St. Louis.

They are Carl Sharp, chairman of the board of Acme Steel Co., R. M. Heskett, president of Montana-Dakota Utilities Co., and John E. Heyke, Jr., president of Brooklyn Union Gas Co.

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MEN AT WORK

Wadsworth Jr Is So Counties GM

Guy W. Wadsworth, Jr. was appointed general manager of Southern Counties Gas Co. at a recent special meeting of the board of directors, succeeding Arthur F. Bridge, former president and general manager, who will continue to serve as president.

G. W. Wadsworth, Jr.

A vice president of the company since 1942, and vice president and assistant general manager since 1947, Mr. Wadsworth will now have the title of vice president and general manager. He began his career with Southern Counties Gas Co. in 1921. In 1928 he became personnel manager of Southern Counties. He was made personnel manager of Southern California Gas Co. in 1937, and elected vice president and director of that company in 1941.

Shaver Joins Columbia Gas System

Karl Shaver, chief of branch in the division of public utilities, Securities and Exchange Commission, has joined Columbia Gas System's treasury department in New York. He went to the SEC in 1935 as an engineer.

Massey on Standards Assn Board

Harold Massey, assistant managing director of Gas Appliance Manufacturers Association, has been reelected to the board of review of the American Standards Association. This is Mr. Massey's third consecutive term as a member of the six-man panel.

Harold Massey

Other members of the board are Virgil M. Graham, director of technical relations, Sylvania Electric Products, Inc.; Harry E. Jordan, secretary, American Water Works Association; W. P. Kliment, engineer of standards, Crane Co.; E. B. Paxton, standards division, General Electric Co.; T. E. Beltfort, manager, Copper and Brass Research Association.

Mr. Massey is also serving a third term as a member of the association's standards council, a post in which he has been active since February, 1947. Early this year he was elected a member of the miscellaneous standard board, and has been an alternate in the conference of executives of organization since 1949.

Rodgers is Blaw-Knox VP and GSM

William Rodgers, who joined Blaw-Knox Co. in April, 1953 in the new staff post of general sales manager, has been elected vice president and general sales manager of the company.

Also, it was announced that E. P. Addition and M. R. Wingard have been appointed sales engineers in the chemical plants division.

AGE Inc Appoints Two Executives

Affiliated Gas Equipment, Inc. has announced two executive appointments at the company. James A. Hughes, a vice president and general manager of Bryant Heater Div. since 1951, has been appointed assistant general manager of AGE, and Howard L. Clary has been appointed assistant general manager of Bryant Heater Div., effective Nov. 1.

Mr. Hughes joined the heater division in 1949 as assistant general manager and was named general manager in 1951. Mr. Clary recently resigned as vice president of Norge Div., Borg-Warner Corp.

United Natural Gas Co Promotes 5

At recent meetings of the directors of United Natural Gas and associated companies, five promotions were made, including the promotion of J. G. Montgomery, Jr., vice president of the companies since 1939, to executive vice president, a newly created office.

The others elected and appointed are: Harry B. Wood, elected a vice president and a director; John A. Comet, elected a vice president and a director; Howard C. Rose, elected secretary-treasurer and a director; and Lawrence J. Fleckenstein, appointed assistant treasurer.

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Commercial central-fan cooling systems
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Radiant-panel heating

AMERICAN GAS JOURNAL
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Fink Retires from Amer Nat Gas Co

Henry Fink, president of American Natural Gas Co. since 1948, has retired from the company but will continue to serve in his present positions with the company's subsidiaries. He is president of Michigan Wisconsin Pipe Line Co., American Louisiana Pipe Line Co. and American Natural Gas Service Co. and chairman of the board, Michigan Consolidated Gas Co.

Mr. Fink, who had continued to serve as president for nearly two years beyond the time for his normal retirement, will remain a director of the company and remain active in the management of the system.

Ralph T. McElvenny has been elected to succeed Mr. Fink as President.

Algonquin Elects Saponaro VP

Frank P. Saponaro has been elected vice-president of Algonquin Gas Transmission Co., and in this position will be in charge of handling the rate, sales and regulatory activities of the company.

Since 1950, Mr. Saponaro has been manager of rates for Texas Eastern Transmission Corp., and for the past several years, he has participated in the work of the rate committees of American Gas Association and Independent Natural Gas Association, having served on a number of subcommittees studying industry-wide regulatory and rate problems.

Foster Is Bklyn Union Gas Director

Glen E. Foster, vice president of The Brooklyn Union Gas Co., was elected director of the company and made a member of the executive committee at a recent board meeting. Mr. Foster became associated with Brooklyn Union in 1933 and was elected vice president in July, 1950.

Grazier is American-Standard Pres

Joseph A. Grazier has been elected president of American Radiator & Standard Sanitary Corp., succeeding Theodore E. Mueller, who was elected chairman of the board of directors.

Mr. Grazier has been serving as president since June, and before that was executive vice president. He is also a director and member of the executive committee of the corporation. Mr. Mueller had served as president of the corporation since 1946. He began his association with American-Standard in 1904.

Empire Names Schutter Branch Mgr

Empire Stove Company has announced the appointment of Cecil H. Schutter as branch manager for the Kansas City, Mo., territory, comprising western Missouri, eastern Kansas, eastern Nebraska and Iowa.

RALPH CARLSON has been appointed regional sales manager, *Whirlpool Corp.*

E. L. CASEY has been named vice president, operations, *Scaife Co.*

E. M. CLORAN has been made district manager, Macnick Div., *Rockwell Mfg. Co.*

W. M. CONNOR will now supervise sales and production liaison between Macnick Div. and divisional plants and field offices, *Rockwell Mfg. Co.*

EDWARD R. DOWNE was appointed vice president, research and development, *C. A. Olsen Mfg. Co.*

GORDON G. DYE is now manager, Northern div., *Southern California Gas Co.*

A. A. FOMILYANT is now general manager, Macnick Div., *Rockwell Mfg. Co.*

DONALD L. GARRISON has been made sales promotion representative, Dresser Manufacturing Div., *Dresser Industries, Inc.*

JOHN T. HEFFERNAN is now on sales staff, *American Meter Co.*

HARRY KANE is now regional sales manager, *Whirlpool Corp.*

ROBERT L. MCALISTER has been appointed to sales staff, *American Meter Co.*

JAMES G. MCKEE was promoted to assistant superintendent of distribution, *Manufacturers Light and Heat Co.*

C. A. RENZ has been appointed manager of special services, *Southern California Gas Co.*

J. N. SHRADER is now manager of customer service, *Southern California Gas Co.*

WALTER A. STERMER has been made assistant industrial sales manager, *Manufacturers Light and Heat Co.*

THURMAN G. THURSTON has been named representative, Cleveland territory, *Selas Corporation of America.*

HUGH L. WATHEN has been promoted to director of sales and public relations, *South Jersey Gas Co.*

JUDSON J. WEHMAN is now sales manager, Bryan, O., *Ohio Gas Co.*

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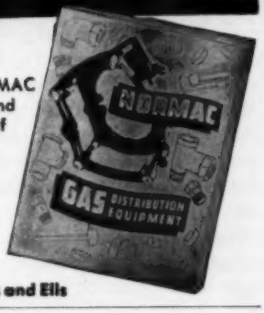

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Gas Utilities Advised on Service Area Extensions

(Continued from page 23)

There is nothing an official can do, except take precautions to avoid injuries. In Enyart v. Santa Company, 241 S. W. (2d) 268, it was shown a metal sign fell on a pedestrian, as she walked along the sidewalk. The higher court awarded her $15,000 damages, saying:

"Plaintiff was 72 years of age when injured. Prior to her injuries, she was an active, cheerful woman, doing all of her housework and the gardening. The rule of reasonable uniformity of verdicts is a sound and desirable one."

Of course, if a damage verdict rendered by a jury is excessively high the higher court may reduce the damage allowance. See Summa v. Mongan Company, 165 S. W. (2d) 390. Here the jury awarded $25,000 damages but the court reduced the award and allowed $17,500 damages for an ordinary injury. Also, see Hoff v. Wabash, 254 S. W. 874. Here the court reduced the jury's damage award of $41,500 to $20,000.

These cases all revolved about injured persons who were relatively aged. The life expectancy of the injured person is a very important factor when determining the amount of damages allowable by a higher court.

In Trowbridge v. Abrasive Company, 190 Fed. (2d) 825, the man named Trowbridge was 44 years of age when he was seriously injured. The jury originally awarded $150,000 but finally the damage allowance was reduced to $126,182. The higher court approved the verdict, saying:

"We need not decide whether the verdict is excessive, for this court will not substitute its judgment for that of the jury or the trial court. A careful study of the evidence of damages in the record has failed to convince us that this verdict was so grossly excessive as to justify reversal on this ground."

In all of these cases the higher courts explained that the present value of the United States dollar is considerably less than it was a few years ago. Therefore, the present damage allowances necessarily must be higher.

Notwithstanding these various new decisions the higher courts have rendered decisions on which we may base rules of "how to avoid liability." For example, very often liability may be avoided by a gas company's employees obtaining information, admissions, or statements from an injured person which may prove in later court procedure that the actual cause of the injury did not result from negligence of gas company officials or employees, but that the injury actually resulted from lack of ordinary care on the part of the injured person to protect himself against the injury. If an admission is obtained that the injured person knew of the existence of the danger, which caused the injury, or that the injured person realized that a dangerous condition was present, then the gas company will not be held liable because no person or gas consumer is entitled to recover damages from a gas company for any injury sustained as a result of his own negligence.

Jury considers facts

When rendering its decision the jury will consider the evidence to determine facts, as follows: (1) Was the person exercising at least an ordinary degree of care to protect himself from injury when the accident occurred? (2) Was the injured person unfamiliar with the fact that the thing which caused the injury was dangerous? (3) Did the gas company officials and employees have knowledge of the defective condition, and, if not, had the defect existed for so long a period that the gas company employees could have discovered and repaired the defect had they used ordinary and reasonable care?

If, after considering all of the testimony and evidence, the jury decides that all of these questions can be answered in the affirmative, then it is bound to render a verdict allowing the injured person damages in an amount sufficient to compensate him for (1) the permanent disability which will reduce his ordinary income; (2) the pain suffered; (3) the loss of time; (4) the expense incurred as a result of the injury; and (5) the loss of income during this period of total disability.

However, if any of the above questions are capable of being answered in the negative, the gas company is not liable. Conversely, a gas company is not liable if the jury decides that an injury did not result from negligence of the gas company's officials or employees.

For example, in the leading case of Jentick v. Pacific Gas & Electric Company, 105 Pac. (2d) 1005, testimony showed that a gas company maintains pipes and conduits in city streets and supplied various consumers with gas. A contractor, employed by the city, was using machinery to dig up the pavement of a street when he punctured a gas line which ultimately resulted in an explosion which seriously injured a gas consumer.

The injured consumer sued the gas company to recover damages and alleged that the gas company employees (1) should have discovered the break in the service pipe and repaired it, or (2) that the gas company employees should have shut off the gas before the contractor started to do his work, and (3) that the gas company employees should have removed from the streets the service pipes serving the residences and likely to be damaged by the contractor.

Also, it was contended by the injured consumer's lawyer that the gas company officials were negligent in failing to file with the town engineer a detailed map showing the location of gas pipes, as required by the city and county ordinance.

The higher court considered all testimony and refused to hold the gas company liable. The court said:

"There is no evidence that at any time the contractor, either personally or by agent, applied to the city engineer or any other officer or employee in the city government to be allowed to inspect a map, or to obtain a copy of a map, of the location of the pipes in Nineteenth avenue. It follows the filing or non-filing of said maps was not a proximate cause of the accident. . . . Again the plaintiff contended the service pipe was negligently installed and maintained. In this connection they rely on the evidence that said pipe was but a few inches beneath the pavement of the street. There was no evidence that such installation or maintenance was negligent. . . . A most careful examination does not disclose any want of care on the part of any person employed by the defendant (gas company)."

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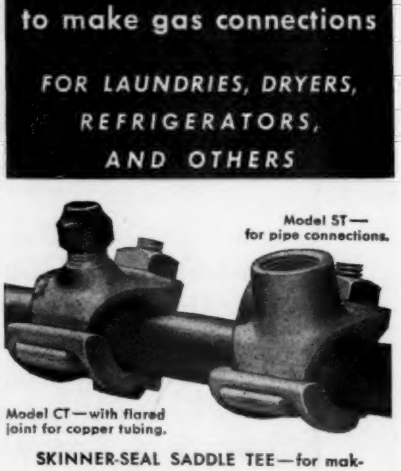

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Eight Awards Given at AGA Convention

J. E. Overbeck—Distribution Award

John E. Overbeck, assistant vice president, Columbia Gas System Service Corporation, received the AGA Distribution Achievement Award sponsored by American Meter Company, Philadelphia, Penna.

The Distribution Achievement Award, a Certificate of Merit and $1,000, is presented each year to the individual judged to have made the most outstanding contribution to gas distribution in the past year or in the past five years.

Mr. Overbeck received the award for his efforts in development of procedures and methods of gas measurement. Many of the procedures he assisted in developing are being placed in use by gas utilities converting from manufactured to natural gas. He is the author and co-author of several publications on metering. In 1950 he developed a method for analyzing in-tests on meters removed from service for periodic tests. This method proved of value to several utilities in presenting data to regulatory agencies.

H. P. Morehouse—Achievement Award

H. Preston Morehouse, assistant sales manager—gas, Public Service Electric and Gas Company, Newark, received the AGA Distinguished Service Award for his outstanding contributions to the gas industry.

The Distinguished Service Award, an engrossed certificate and a financial recognition, is one of the top honors in the gas industry, given to the person who, in the opinion of the AGA board of directors, has made an individual contribution of distinguished character in the interest of the gas industry.

Under the leadership of Mr. Morehouse, the AGA "Reference Manual of Modern Gas Service" was organized. This information book on the use of gas in new homes was specifically designed for architects, builders and others in that field.

Also, under Mr. Morehouse's leadership, a "Guide For Installers of Central Heating Systems, Conversion Burners, Floor Furnaces, Vented Space Heaters and Unit Heaters" was prepared for plumbers, contractors and other installers who should follow safe and efficient practices in installing gas heating units.

To Five—McCall's Awards

Outstanding accomplishments in home service work were given recognition when five winners were presented with the AGA Achievement Awards, sponsored by *McCall's*. Cash prizes totaling $1,000 and bronze plaques were awarded to individual members of home service organizations judged to have made the most effective contributions to modern homemaking by promoting gas and modern gas equipment.

The five awards were made to representatives of companies in three divisions.

Miss Flora G. Dowler, director of home economics, The Manufacturers Light & Heat Co., Pittsburgh, was winner in Division "A" which includes heads of home service departments with more than five individuals. She was cited for her description of a departmental reorganization activated by the company's appliance dealer promotion program.

In Division "B," confined to home service departments of five or fewer members, the award was given to Mrs. Gladys V. Bramblett, home service director, Fall River (Mass.) Gas Works Co., for an effective Know-Your-Neighbor program in which the gas company cooperated with civic groups toward a better understanding of the food habits of various nationalities in the city.

Three awards were given in Division "C":

Miss Rosemary Locke, home service director, Oklahoma Natural Gas Co., was named in this group for her outline of a successful promotion of skits, lectures and dealer demonstrations in a company range campaign.

Miss Jeanne Snodgrass, home service kitchen planning consultant, The Ohio Fuel Gas Co., was given an award on the basis of proof that a kitchen planning program pays off in better customer and community kitchens and in the school domestic science laboratories of the area served by her company.

Mrs. Winnell Simmons, home service director, Houston Natural Gas Corp, received

AWARD WINNERS AT AGA CONVENTION

Major award winners at the American Gas Association convention: bottom—four of the five winners of Home Service Achievement Awards for outstanding accomplishment, sponsored by "McCall's," left to right, Miss Jeanne Snodgrass, The Ohio Fuel Gas Co., Columbus; Miss Rosemary Locke, Oklahoma Natural Gas Co., Tulsa; Mrs. Winnell Simmons, Houston Natural Gas Corp.; and Miss Flora G. Dowler, The Manufacturers Light & Heat Co., Pittsburgh. A fifth winner was Mrs. Gladys V. Bramblett, Fall River (Mass.) Gas Works Co. Back—left to right, Patrick J. McPartlan, Consolidated Edison Co. of New York, Inc., who won the Meritorious Service Medal of AGA for outstanding bravery; H. Preston Morehouse, Public Service Electric & Gas Co., Newark, who received the AGA Distinguished Service Award for contributions to the gas industry; and John E. Overbeck, Columbia Gas System Service Corp., Columbus, Ohio, received the AGA Distribution Achievement Award, sponsored by American Meter Co., for most outstanding contribution to the science and art of gas distribution in the past five years.

Frank H. Adams, president, Surface Combustion Corp., receiving the distinguished service award of Gas Appliance Manufacturers Association, from Fred C. Schaefer, sales manager, American Gas Furnace Co., and chairman, industrial gas equipment division, during the recent American Gas Association convention.

an award for an accounting of inter-department cooperation in a company campaign to dramatize automatic clothes dryers.

P. J. McPartlan—Merit Service Medal

Patrick J. McPartlan, a rigger for Consolidated Edison Company of New York, Inc., was awarded the highest honor of the gas industry for individual outstanding bravery. He received the AGA Meritorious Service Medal.

The award consists of a gold medal, a button and a certificate of merit. It is made possible by a fund donated by the late Walter R. Addicks, senior vice-president, Consolidated Gas Company of New York, predecessor of Consolidated Edison.

Mr. McPartlan won the award for conspicuous bravery when he rescued an unconscious fellow worker from the top of a smoke stack. A man who was at work on a 250′ stack at Consolidated Edison's Hunts Point gas plant was overcome by wind carrying waste gases from the chimney. A fellow worker lashed the man to the iron rungs of the stack and descended for help.

Mr. McPartlan climbed the stack, in a wind of about 40 mph. He fought the gases and wind in freeing the man, whose left leg had become wedged behind an iron rung. Then Mr. McPartlan hooked the man's safety belt to a rope and pulley used for hoisting materials, and climbed down the stack apace with the limp body, to keep it from being buffeted against the stack by the wind. The Police Emergency Squad then applied inhalators to McPartlan and the unconscious worker.

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More Natural Gas in View for Northeast

An additional supply of natural gas for the New York metropolitan area was proposed recently when Tennessee Gas Transmission Company applied to Federal Power Commission for approval to build a $45,000,000 line from northern Pennsylvania to the New York-Philadelphia metropolitan areas. The line would run about 243 miles.

At the same time, Transcontinental Gas Pipe Line Corp. has announced it is working on plans to increase delivery of natural gas to the New York-New Jersey-Philadelphia metropolitan areas. Tom P. Walker, president of Transcontinental, says that details of the company's plans will be announced in the near-future.

The program reported by Tennessee Gas Transmission includes development of additional underground storage facilities in Pennsylvania and New York to provide reserve supplies for peak periods in winter. The main storage fields, in northern Pennsylvania, would increase the peak daily delivery capacity of Tennessee Gas system to 2,100 MMcf, a gain of 130 MMcf daily, it has been estimated.

Through looping and other gathering lines, the system's lineage now totals 6,500 miles.

Gardiner Symonds, president of Tennessee Gas, in announcing the project, said: "Eight of the larger gas distribution companies in the New York-Philadelphia area have signed contracts, subject to approval of FPC, to purchase from our company 126 MMcf of natural gas daily on a firm, noninterruptible basis."

He listed Consolidated Edison Co. of New York, Inc., Brooklyn Union Gas Co., Long Island Lighting Co., Philadelphia Gas Works Co., and Public Service Electric and Gas Co. (Newark), as among those interested in obtaining gas from Tennessee Gas.

The proposed pipeline would run from the Tennessee Gas pipeline at Hebron storage field at the New York-Pennsylvania border to a point near Greenwich, Conn., where it would connect with Northeastern Gas Transmission Co., New England's Tennessee subsidiary. Thus, it would form a southern arc and complete a 1,000-mile loop running through the New York, New Jersey, Pennsylvania and the New England territory. The loop would begin and end near Mercer, Pa.

United Gas to Write Off $3 Million

United Gas Corp., one of eight original sponsors of the ill-fated $49 million synthetic gasoline plant of Carthage Hydrocol, Inc., has agreed to write off its $3,775,808 investment as a complete loss, if the plan is approved by the Securities and Exchange Commission.

The plan for writing off the investment was prepared by Reconstruction Finance Corp., which holds $17,750,000 of first mortgage notes of Carthage Hydrocol, and was disclosed recently in a United Gas prospectus concerned with the proposed sale of $25 million of debentures. Several of the other sponsors also are reported as ready to agree to the plan, to avoid RFC foreclosure proceedings on the first mortgage lien indebtedness.

Carthage Hydrocol was formed in 1946, with $10 million advanced by the eight sponsors to build a plant near Brownsville, Tex., for making gasoline from natural gas. The plant was to operate on a variation of a method that P. C. Keith studied while in Germany. Operations, which began in August, 1950, never reached full production and were ended last July.

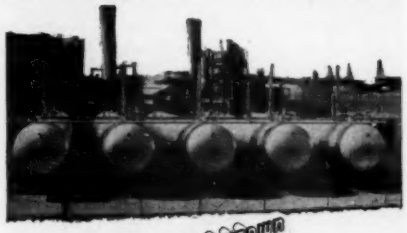
New Magazine Enters Industry

Petroleum and Natural Gas Digest, a monthly magazine containing reviews of articles appearing in oil and gas industry publications, made its initial appearance in October when the first edition was issued. The new magazine will present reviews of articles covering such subjects as natural gas engineering, transmission, pipeline service and storage, and geology.

On the staff of the publication are: Dr. J. N. Breston, technical editor; Dr. J. C. Calhoun, consulting editor, and G. G. Bauer, managing editor.

The departmental editors are: Wakefield Dort, Jr., Petroleum and geology; Benjamin F. Howell, Jr., geophysics; John C. Griffiths, petrology; William Lytle, prospecting and exploration; Frank M. Brewster, Jr., drilling; John F. Buckwalter, well servicing; John C. Calhoun, Jr., petroleum production and reservoir engineering; Luther T. Bissey, gas production engineering; and Oscar F. Spencer, transmission and storage.

NATURAL GAS STANDBY



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FEDERAL POWER COMMISSION

(Continued from page 24)

Arkansas Louisiana May Abandon Service to Mississippi River Fuel

The Commission has affirmed the decision of a presiding examiner permitting Arkansas Louisiana Gas Company to abandon service of approximately 12,500 Mcf of natural gas per day to Mississippi River Fuel Corp.

The examiner's decision supported conclusions by the FPC staff and Arkansas Louisiana that the discontinuance of service would result in economic benefits to the applicant without adverse affect on Mississippi River Fuel Corp.

Operating Revenues Up in 1952

Federal Power Commission reported early this month that gas operating revenues of 150 natural gas companies filing annual reports with FPC totaled $2,277,316,000 for the year 1952. Sales of natural gas by the companies amounted to 7.64 trillion cubic feet.

Sales of natural gas and revenues from such sales, reported by the predominantly natural gas companies amounted to 7.10 trillion cubic feet and $1,884,919,000, respectively, representing increases of 9.7% in sales and 17.7% in revenues, over 1951. Service was supplied to an average of 7,270,000 customers during 1952, for an increase of 6.3% over 1951.

Gas operating revenue deductions, including charges for operations and maintenance and provision for depreciation and taxes, amounted to $1,678,693,000 and, in relation to revenues, increased slightly to 85.5 cents, per revenue dollar, in 1952.

Gas utility operating income for the year amounted to $288,730,000 and was equivalent to 5.8% of the average net gas investment for the year.

Gross income of the companies, including income of $1,527,000 from utility operations other than gas and $11,502,000 nonoperating income, amounted to $301,759,000 for 1952. Income deductions aggregated $91,888,000. Net income of the companies for 1952 amounted to $209,871,000, representing an increase of 3.3% over 1951.

Operating Revenues and Income Up in August

Operating revenues of natural gas companies reporting to the Commission totaled $152,801,991 in August of 1953, an increase of 20.7% over August 1953. For the 12 months ended August 31, revenues aggregated $2,224,106,088, or 21.8% higher than in 1952.

Gas utility operating income for August 1953, amounted to $15,334,748, up 29.7% over August of last year. For the 12 months gas utility operating income was $315,056,542, representing an increase of 17.6% over the comparable period in 1952.

Net gas utility plant of the reporting companies aggregated $5,318,132,817 on August 31, up $528,789,308, or 11% over a year ago.

Gas operating revenue deductions amounted to $137,652,599, an increase of 19.8%. Gas sales to ultimate consumers during the month were 199,710,000,000 cubic feet, an increase of 12.2% over August 1952. Sales to residential, commercial and industrial consumers increased 7.1%, 7.4%, and 14%, respectively, while revenues from the 3 classes of service increased 12.6%, 15.7%, and 24.2%, respectively. Revenues from all sales to ultimate consumers increased 19.6%, and amounted to $59,280,663.

Net income of the companies was $7,273,017, up 38.1%, from August 1952. For the 12 months ended August, net income of $227,544,562 represented an increase of 13.9% over the comparable period ended August 1952.

New La-to-Mich Line To Move 300 MMcf Daily

American Louisiana Pipe Line Co. has asked Federal Power Commission to authorize construction of a $130,000,000 pipeline which will be adequate to supply all the present and future additional gas requirements of the American Natural Gas Co. system.

American Louisiana is a newly-formed subsidiary of American Natural Gas Co. Other companies in the system are Michigan Consolidated Gas Co., Milwaukee Gas Light Co., and Michigan-Wisconsin Pipe Line Co.

The company said its new pipeline will result in the removal of all restrictions now in effect on the sale of gas for heating and other purposes by all utility customers served by Michigan-Wisconsin.

The American Louisiana pipeline will have an initial capacity of 300 MMcf per day, or 109 billion cubic feet a year. The 30-inch line will extend for approximately 1,200 miles from gas fields west of New Orleans, La., to Detroit and to a connection with the Michigan-Wisconsin pipeline near Niles, Mich. Compressor capacities will total 30,000 hp.

All of the American Louisiana gas will be purchased by Michigan Consolidated and Michigan-Wisconsin. Each of these companies will enlarge their facilities to handle the additional gas supply. As a result, Michigan-Wisconsin will be able to increase substantially its gas deliveries to markets in Wisconsin and elsewhere.

The company plans to begin construction of the line by July 1, 1954 or as soon as approval is obtained from government regulatory bodies. The line is to be completed and in operation in the latter part of 1955.

The pipeline will purchase approximately 250 MMcf daily from major producers in southern Louisiana and will also buy a daily average of about 50 MMcf from Texas Gas Transmission Corp. Nearly three trillion cubic feet of gas have been committed to the new line.

The additional gas provided by the new facilities will enable American Natural to meet firm requirements in its markets for approximately 250 billion cubic feet a year and interruptible service of about 15 billion cubic feet.

Colo Interstate Proposes Tie-In

An application has been filed with Federal Power Commission by Colorado Interstate Gas Co. to construct pipeline facilities in Kansas and Oklahoma to make additional natural gas available to Natural Gas Pipeline Co. of America.

In a separate application, Natural Gas Pipeline is seeking authority to build additional facilities to enable it to take this gas into its pipeline system.

Colorado Interstate's proposed project, estimated to cost $3,604,950, would include 49.5 miles of 20-inch pipeline from the Morton county, Kans., gas field, to a point near Hooker, Okla.

The facilities would enable Colorado Interstate to deliver about 19 MMcf per day to Natural in addition to present contract volumes. The project also would provide an outlet for gas volumes from the Morton county field reserves in excess of those which the company's presently authorized facilities are equipped to handle, the application states.

AGA Officers-Directors-Chairmen Elected at 1953 Convention

Officers

President: Earl H. Eacker, president, Boston Consolidated Gas Co.

First vice president: F. M. Banks, president and general manager, Southern California Gas Co.

Second vice president: Dean H. Mitchell, president, Northern Indiana P. S. Co.

Treasurer: Vincent T. Miles, treasurer, Long Island Lighting Co.

Directors

M. A. Abernathy, vice president, United Gas Pipeline Co.

B. C. Adams, president, Gas Service Co.

L. L. Baxter, president, Arkansas Western Gas Co.

Frank Austin Brownie, president, The Canadian Western Natural Gas Co., Ltd.

Sheldon Coleman, president, The Coleman Co., Inc.

H. C. Cummins, first vice president, Northern States Power Co.

J. F. Donnelly, vice president in charge of sales, Servel, Inc.

John E. Heyke, Jr., vice president, The Brooklyn Union Gas Co.

J. K. Horton, president, Pacific Public Service Co.

D. E. Karn, president, Consumers Power Co.

W. H. Ligon, president, Nashville Gas Co.

A. W. Lundstrum, president, Ohio Fuel Gas Co.

F. T. Parks, vice president in charge of operations, Public Service Co. of Colorado.

L. B. Richards, vice president, Harrisburg Gas Division, The United Gas Improvement Co.

J Theodore Wolfe, executive vice president, Consolidated Gas Electric Light and Power Co.

Section Chairmen

Accounting: Paul E. Ewers, commercial office manager, Michigan Consolidated Gas Co.

Industrial and Commercial: Charles C. Eeles, district industrial sales manager, The Ohio Fuel Gas Co.

Operating: Frederick J. Pfluke, superintendent of gas operations, Rochester Gas & Electric Corp.

Residential: Raymond Little, general sales manager, Equitable Gas Co.

General Management: Lovett C. Peters, financial vice president, Laclede Gas Co.

GAS INDUSTRY CALENDAR

November

9-13 National Hotel Exposition, Kingsbridge Armory, New York.
9-13 American Petroleum Institute, Conrad Hilton Hotel and Palmer House, Chicago.
10 Joint committee on dealer cooperation, AGA, GAMA, Hotel Roosevelt, New York.
11-13 Wisconsin Utilities Association, Hotel Schroeder, Milwaukee, Wis.
17-20 AGA operating section, organization meetings, Hotel New Yorker, New York.
18-20 Mid-Southeastern Gas Association, Sir Walter Hotel, Raleigh, N. C.
29-December 4 The American Society of Mechanical Engineers, Statler Hotel, New York.
30-December 2 Southern Gas Association, advisory council and management conference, Grand Hotel, Point Clear, Ala.

December

1-4 University of Oklahoma corrosion conference, University of Oklahoma.

January, 1954

14-21 National housewares and home appliance exhibits, Navy Pier, Chicago.
17-21 National Association of Home Builders convention and exposition, Chicago.

February, 1954

8-12 Western winter radio-television & appliance market, Western Merchandise Mart, San Francisco.

March, 1954

4-5 AGA transmission and storage conference, Jung Hotel, New Orleans.
15-17 Mid-West Gas Association, Fort Des Moines Hotel, Des Moines, Iowa.
25-26 Oklahoma Utilities Association annual convention, Biltmore Hotel, Oklahoma City.
25-26 New England Gas Association, Hotel Statler, Boston.

April, 1954

5-7 Southern Gas Association (Location to be announced)
12-14 AGA Sales Conference on Industrial and Commercial Gas, Edgewater Beach Hotel, Chicago.
13-15 Southwestern gas measurement short course, University of Oklahoma, Norman, Okla.
20-23 AGA Distribution, Motor Vehicles and Corrosion Conference, Mount Royal Hotel, Montreal, Canada.
22-23 Indiana Gas Association, annual meeting, French Lick Springs Hotel, Chicago.
26-28 Mid-West Regional Sales Conference, Edgewater Beach Hotel, Chicago.
26-28 The 1954 annual convention, Southern Gas Association, Houston.

May, 1954

10 (week) 35th Annual National Restaurant Convention and Exposition, Navy Pier, Chicago.
10 (week) AGA commercial gas school, Chicago.
10-13 LPGA Annual Convention, Conrad Hilton Hotel, Chicago.
19-21 GAMA annual meeting, The Drake, Chicago.
24-26 AGA Production and Chemical Conference, Wm. Penn Hotel, Pittsburgh.
27-28 Natural Gas and Petroleum Association of Canada, Prince Edward Hotel, Windsor, Ontario, Canada.

June, 1954

20-24 Canadian Gas Association, Banff Springs Hotel, Banff, Alberta, Canada.
28-29 Michigan Gas Association, Grand Hotel, Mackinac Island, Mich.

July, 1954

12-16 National housewares and home appliance exhibits, Auditorium, Atlantic City, N. J.
19-23 Western summer radio-television and appliance market, Western Merchandise Mart, San Francisco.

September, 1954

8-10 Pacific Coast Gas Association, Victoria, British Columbia.
28-29 Texas Mid-Continent Oil and Gas Association, Baker Hotel, Dallas.

October, 1954

11-14 AGA annual convention, Atlantic City, N. J.
18-22 National Safety Council, Chicago.

November, 1954

1-5 National Metal Exposition, Chicago.
28-December 3 The American Society of Mechanical Engineers, Statler Hotel, New York.

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